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**DAHLGREN DIVISION  
NAVAL SURFACE WARFARE CENTER**

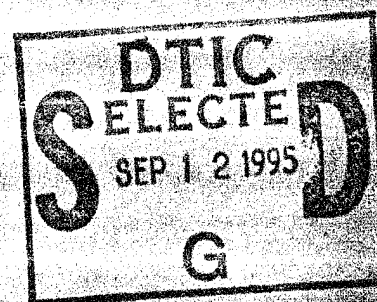
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**NSWCDD/MP-95/67**

**DAHLGREN DIVISION PUBLICATIONS  
FORMAT GUIDE**

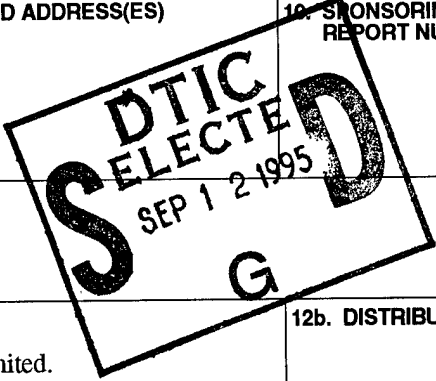
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## FOREWORD

The *Dahlgren Division Publications Format Guide* is to be used to prepare Naval Surface Warfare Center, Dahlgren Division (NSWCDD) publications including technical reports, technical notes, miscellaneous publications, and administrative publications. This *Guide* is intended to unify NSWCDD publications at Dahlgren, Virginia, and Coastal Systems Station, Panama City, Florida, by clarifying processes and detailing current elements of format.

This *Guide* supersedes NAVSWC/MP-92/2 and NCSC Technical Manual 122-82, Revision A; implements SECNAVINST 3900.29C and ANSI Z39.18-1987; and supplements NSWCDDINST 5219.1.

The *Guide* has been reviewed by the following: Security Office, Technical Information Division, Patent Counsel, and Public Affairs.

If there are any questions or comments about the *Guide*, please contact the Technical Information Division (Dahlgren), commercial (540) 653-8921 or DSN 249-8921 or the Technical Publications Branch (Panama City), commercial (904) 234-4940 or DSN 436-4940. Comments are welcome and will be considered when the *Guide* is revised.

Approved by:



WALKER P. JOHNSON, Head  
Information Management Department

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## CHAPTER 1

### GENERAL INFORMATION

This *Guide* applies to all Naval Surface Warfare Center, Dahlgren Division (NSWCDD) [Dahlgren and Coastal Systems Station (CSS)] Technical Reports (TRs) and Technical Notes (TNs), and may also be used as guidance in preparing Miscellaneous Publications (MPs) and Administrative Publications (APs).

Preparation of Technical Manuals (TMs) is under the cognizance of the Head, Technical Information Division who, as data manager for Division technical publications, establishes and maintains liaison with command-level TMs management councils. Therefore, although TMs are defined in this chapter, TM preparation instructions are not in this *Guide*. Requests for TM preparation should be made to the Technical Publications Branch.

#### APPLICABLE PUBLICATIONS

ANSI Z39.18-1987, *Scientific and Technical Reports—Organization, Preparation, and Production*, 6 Mar 1987

*Abstracting Scientific and Technical Reports of Defense-Sponsored RDT&E*, AD-667 000 (DDC, Mar 1968)

COASTSYSTAINST 5500.12, Subj: *Coastal Systems Station Information and Personnel Security Manual*

COASTSYSTAINST 5720.4E, Subj: *Release to the Public of Unclassified Technical Information*

DOD Directive 4525.8-M of 28 Sep 1992, Subj: *Official Mail Manual*

DOD Directive 5230.24 of Mar 1987, Subj: *Distribution Statements on Technical Documents*

DOD Directive 5230.25 of May 1985, Subj: *Control of Unclassified Technical Data with Military or Space Application*

NAVSWCINST 4330.1B of 25 Jun 1992, Subj: *Procurement of Technical Data*

NAVSWCINST 5510.1B of 8 Mar 1991, Subj: *Information Security Manual*

NSWCDDINST 5219.1, Subj: *Publications Program*

OPNAVINST 5218.7A of 28 Sep 1992; Subj: *Navy Official Mail Management Correction Sheet*

OPNAVINST 5510.1H of 29 Apr 1988, Subj: *Department of the Navy Information and Personnel Security Program Regulation*

SECNAVINST 3900.29C of 19 Mar 1991, Subj: *Standard Format Requirements for Scientific and Technical Reports*

SECNAVINST 5216.5C of 24 Aug 1983, Subj: *Department of the Navy Correspondence Manual*

SECNAVINST 5510.34 of 4 Nov 1993, Subj: *Manual for the Disclosure of Department of the Navy Military Information to Foreign Governments and International Organizations*

SECNAVINST 5600.15 of 2 Sep 1960, Subj: *Standards and Guidelines on the Content, Distribution, and Production of Publications and Printing*

SECNAVINST 5600.20 of Jan 1984, Subj: *Department of the Navy Graphic Design Standards*

*Standard Navy Distribution List Part 1 and Operating Forces of the Navy, Unified and Specified Command, U.S. Elements of International Commands*, OPNAV P09B2-107 (Washington, D.C., Chief of Naval Operations), latest edition

*Standard Navy Distribution List, Part 2 and Catalog of Naval Shore Activities*, OPNAV P09B2-105 (Washington, D.C., Chief of Naval Operations), latest edition

*U.S. Government Printing Office Style Manual* (Washington, D.C., U.S. Government Printing Office), Mar 1984

## TYPES OF NSWCDD PUBLICATIONS

A brief description, review and approval process, and distribution of each type of publication is given. A summary of this section is provided in Table 1-1. Table 1-2 provides a list of elements for each type of publication. Guidance for classification markings for classified publications is contained in Chapter 5.

### Interagency Publication

NSWCDD publishes reports for sponsoring organizations and reports covering joint efforts with other government agencies; these reports may be published in the report series of another agency, NSWCDD, or both. The Technical Publications Branch will provide assistance in determining the appropriate series and preparing the publication.

### Contractor-Prepared Publication

A technical publication prepared as a deliverable under contract to NSWCDD will conform to NSWCDD regulations, and its distribution is subject to regulations governing security, foreign dissemination, and proprietary information. These reports are published as an NSWCDD publication and are assigned an NSWCDD publication identification number. This number is requested by the NSWCDD Contracting Officer's Technical Representative or the technical point-of-contact



or monitor before the contractor begins preparing the publication. The Technical Publications Branch will provide consultation and furnish a copy of this *Guide* for submission to the contractor as government-furnished material. Procurement of technical reports is governed by NAVSWC-INST 4330.1B. Such publications will be included on the Contract Data Requirements List (CDRL) (DD Form 1423), which is routed to the Technical Information Division (Dahlgren) and the Program Support Office (CSS) for data manager approval. The contractor-prepared publication is subject to the same review and approval process as NSWCDD-prepared reports.

TABLE 1-1. TYPES OF NSWCDD PUBLICATIONS

ADMINISTRATIVE PUBLICATION (AP)	
<b>Definition</b>	Presents the results of managerial or administrative studies, surveys, or research (e.g., training manual, management report, personnel survey, or booklet that contains information about NSWCDD). Excluded from this series are management studies that relate to individual departments (unless inclusion is desired by the department studied), budgetary and statistical reports, and forms and publications that fall within the Division's directives system.
<b>Review</b>	Reviewed by the author's branch head, division head, technical office head (if applicable), and department head for content, technical accuracy, and logical presentation of material. In addition, it is reviewed by Patent Counsel, Security Office, Technical Publications, and (if applicable) Public Affairs.*
<b>Approval</b>	Approved by the author's department head, but approval authority may be delegated to the division head or technical office head when appropriate. When prepared by more than one department, an AP is reviewed and approved by the heads of all the departments involved in the total effort, or by higher authority.
<b>Distribution</b>	Distributed both internally and externally. Distribution is subject to security, foreign dissemination, and proprietary information regulations. The author is responsible for providing a distribution list in accordance with the procedures described in Chapter 4.
<b>Retrievability</b>	Becomes part of the Division's libraries.
<b>Format</b>	Is dictated by the content and purpose of each publication. It is flexible to meet the specific needs of each case, provided the publication conforms to publishing regulations. The Technical Publications Branch will provide assistance in format determination. See Table 1-2.
MISCELLANEOUS PUBLICATION (MP)	
<b>Definition</b>	Presents data that does not align the document into one of the other NSWCDD categories (e.g., publications that consist of compilations of data; brochures that describe capabilities of facilities, projects, or groups; or publications that review a collection of projects, conference proceedings, bibliographies, handbooks, user guides or manuals, and software program documentation).
<b>Review</b>	Reviewed by the author's branch head, division head, technical office head (if applicable), and department head for security classification, content accuracy, logical presentation of material, and adequate conclusions. In addition, an MP is reviewed by Patent Counsel, Security Office, Technical Publications, and (if applicable) Public Affairs.*
<b>Approval</b>	Approved by the author's department head, but approval authority may be delegated to the division head or technical office head when appropriate. When prepared by more than one department, an MP is reviewed and approved by heads of all the departments involved in the total effort, or by higher authority.
<b>Distribution</b>	Distributed both internally and externally. Distribution is subject to security, foreign dissemination, and proprietary information. The author is responsible for providing a distribution list in accordance with the procedures described in Chapter 4.

\* Form 5720/4, Revision 10-90, must be used for all reports processed for public release.

TABLE 1-1. TYPES OF NSWCDD PUBLICATIONS (Continued)

MISCELLANEOUS PUBLICATION (MP) (Continued)	
<b>Retrievability</b>	Becomes part of the Division's technical libraries. An MP prepared for external distribution becomes part of the permanent store of information available through the retrieval systems of Department of Defense (DOD) and other institutions. A Report Documentation Page [Standard Form (SF) 298], used by the Defense Technical Information Center (DTIC), is prepared for each external MP to facilitate retrievability of the report. This requirement is not mandatory for an MP prepared for internal distribution or an MP that is sensitive (e.g., a proposal) or nontechnical in nature.
<b>Format</b>	Prepared in TR format or in a format designed to fill its specific requirements. Table 1-2 lists the MP elements. If a special format is required (e.g., for brochures), contact the Technical Publications Branch prior to preparation.
TECHNICAL MANUAL (TM)	
<b>Definition</b>	Contains a description of equipment, weapons, or systems, with instructions for effective use, including one or more of the following sections as required: instructions covering initial preparation and installation, operating instructions, maintenance instructions, overhaul instructions, parts listings, and related technical information or procedures exclusive of those procedures of an administrative or tactical nature.
<b>Publication</b>	Prepared under the cognizance of the Head, Technical Information Division who, as data manager for Division technical publications, establishes and maintains liaison with command-level TM management councils. Personnel who have program requirements for a TM should consult with the Technical Publications Branch to make advanced arrangements for TM preparation.
<b>Review</b>	Is dependent on sponsorship, program management, and intended use in each case.
<b>Distribution</b>	Distributed both internally and externally. It receives wide distribution among military schools, training commands, evaluation commands, and fleet-level planning commands. Distribution is subject to NSWCDD regulations and regulations governing security, foreign dissemination, and proprietary information.
TECHNICAL NOTE (TN)	
<b>Definition</b>	Is an interim report for NSWCDD use that presents technical information of a fragmentary or transitory nature (e.g., preliminary technical and experimental data, test results, or other investigations of immediate use within the Division). It is often used for recording preliminary material that will later be converted to other types of publications. A TN gives authors a rapid, economical method to document for in-house dissemination.
<b>Review</b>	Reviewed by the author's branch head, division head, and/or technical office head (if applicable) for security classification, technical accuracy, and logical presentation of material. In addition, it is reviewed by Patent Counsel, Security Office, and Technical Publications.
<b>Approval</b>	Approved by the author's division head (and/or technical office head, if applicable), but approval authority may be delegated to the branch head when appropriate.
<b>Distribution</b>	Provides the principal means of communicating interim technical information within NSWCDD; therefore, distribution is limited to NSWCDD. The author is responsible for providing an internal distribution list in accordance with the procedures described in Chapter 4.
<b>Retrievability</b>	Becomes part of the Division's technical libraries.
<b>Format</b>	Prepared in the same format as a TR. Table 1-2 lists the TN elements.

TABLE 1-1. TYPES OF NSWCDD PUBLICATIONS (Continued)

TECHNICAL REPORT (TR)	
<b>Definition</b>	Presents technical information or reports scientific and technical work to sponsors and the scientific community. It is usually investigative, analytical, or theoretical and contains conclusions and recommendations. A TR documents a program or a program phase; e.g., a research and development (R&D) publication documents the results of studies, surveys, or research in direct support of the Division mission; or a test and evaluation publication documents test programs and technical evaluations of complete weapon systems, components, or other major projects, as well as testing techniques, facilities, and instrumentation. Experimental and preliminary tests, studies, or projects may be included.
<b>Review</b>	Reviewed by the author's branch head, division head, technical office head (if applicable), and department head for security classification, technical accuracy, logical presentation of material, and validity of conclusions. In addition, it is reviewed by Patent Counsel, Security Office, Technical Publications, and (if public release) Public Affairs.*
<b>Approval</b>	Approved by the author's department head, but approval authority may be delegated to the division head or technical office head when appropriate. When prepared by more than one department, a TR is reviewed and approved by heads of all the departments involved, or by higher authority.
<b>Distribution</b>	Distributed both internally and externally to engineers and scientists, DOD activities, government agencies, private industry, and educational institutions; therefore, it constitutes one of the Division's principal means of in-depth reporting on technical subjects. Distribution is subject to security, foreign dissemination, and proprietary information regulations. The author is responsible for providing a distribution list in accordance with the procedures described in Chapter 4.
<b>Retrievability</b>	Becomes part of the Division's technical libraries. It also becomes part of the permanent store of information available through the retrieval systems of DOD and other institutions. A Report Documentation Page (SF 298), used by DTIC, is prepared for each external TR to facilitate retrievability of the report.
<b>Format</b>	Prepared to fix format standards to ensure high quality and uniformity. Table 1-2 lists the TR elements.

\* Form 5720/4, Revision 10-90, must be used for all reports processed for public release.

TABLE 1-2. ELEMENTS OF NSWCDD PUBLICATIONS

Elements	TR		TN		MP		AP	
	Required	Optional	Required	Optional	Required	Optional	Required	Optional
<b>FRONT</b>								
Cover	X		X		X		X	
SF 298	X					X*		
Foreword	X		X			X*		X*
Contents	X		X			X*	X	
Illustrations	X**		X**		X**		X**	
Tables	X**		X**		X**		X**	
Glossary (Optional)		X		X		X		X
Executive Summary (Optional)		X		X		X		X

\* Required if done in a technical report format.

\*\* If illustrations, tables, or references are included in the report.

TABLE 1-2. ELEMENTS OF NSWCDD PUBLICATIONS (Continued)

Elements	TR		TN		MP		AP	
	Required	Optional	Required	Optional	Required	Optional	Required	Optional
<b>MAIN BODY</b>								
Text	X		X		X		X	
References (Optional)	X**		X**		X**		X**	
Bibliography (Optional)		X		X		X		X
<b>BACK</b>								
Appendixes (Optional)		X		X		X		X
Index (Optional)		X		X		X		X
Distribution	X		X			X*		X*
Back Cover	X		X		X		X	

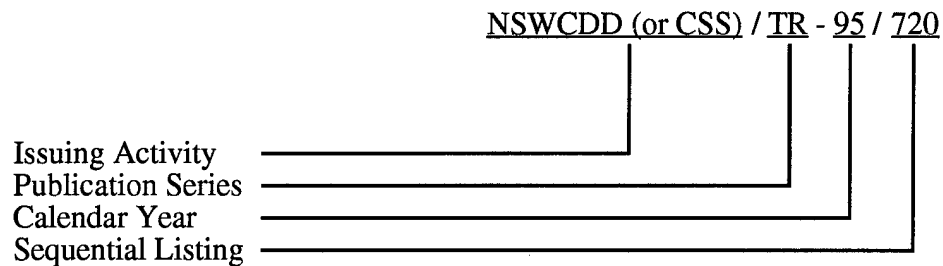
\* Required if done in a technical report format.

\*\* If illustrations, tables, or references are included in the report.

## PUBLICATION IDENTIFICATION NUMBER

Each publication carries an alphanumeric designation. These publication numbers are issued by the Technical Publications Branch to the author or editor who is responsible for publishing the document.

### Example of a Publication Identification Number



### Obtaining a Number

A publication identification number is requested when the publication has been approved for writing. Publication numbers are assigned by the Technical Publications Branch. The following information must be provided when the publication number is requested: type of publication, title, classification of publication, and the author's name, organizational code, and extension. The Technical Publications Branch must be notified of any changes or cancellation.

### Canceling a Number

If a publication is discontinued after a number has been assigned, the author must notify the Technical Publications Branch so the number may be canceled.

## PUBLICATION TITLE

The title should be as brief as possible without sacrificing meaning. The use of articles (a, an, the) in the title is discouraged. The first word should be descriptive because the report will be filed at Division libraries and DTIC under the first word of the title. The title should always be UNCLASSIFIED.

## PUBLICATION DATE

The date of the publication will be the month/year it is sent to Defense Printing. However, the author may request the date that the publication first started the review process be used because of time-sensitive information within the publication.

## TYPEFACE

The recommended font size for publications is 10- or 12-point, except for illustration and table titles within the text and the distribution list, which should be 10-point. The recommended font style is Times for Macintosh and CG Times or Times Roman for personal computers. If the report is computer generated, a letter-quality printer must be used; dot-matrix print is not acceptable. Left or full justification of text is optional.

## PAGINATION

### Front Elements

Page numbers are centered 1/2-in. from the bottom of each page. Lowercase Roman numerals are used for the front elements of a publication (including the SF 298, foreword, contents, lists of illustrations and tables, glossary, and executive summary).

### Main Body

The main body of a publication is numbered consecutively with Arabic numerals or compound-numbered based on chapter/section designation (e.g., 1-1, 2-1, etc.).

If chapters/sections are used, they are sequentially numbered with Arabic numerals (1, 2, 3, etc.). Headings and paragraphs are numbered only when necessary for clarity. If numbering is required, it should be decimal style and limited to four levels (e.g., 5.0, 5.1, 5.1.1, 5.1.1.1).

### Back Elements

Appendixes. An appendix is compound-numbered based on appendix designation (e.g., A-1, B-1, C-1). If a title page is included at the beginning of the appendix, the page number for the title page is A-1/A-2. The page that begins the text of the appendix is numbered A-3.

Index. The index is compound-numbered (e.g., IN-1, IN-2).

Distribution. The page number on the distribution list appears in parentheses beginning with the Arabic numeral one; i.e., (1).

## EQUATION NUMBERING

Equations that are part of a series or are referred to in the text are numbered consecutively with Arabic numerals; e.g., (1), (2), etc. If the pages of the publication are compound-numbered, equations are compound-numbered. Each equation number is enclosed in parentheses at the right margin on the last line of the equation. Spell out and initial cap "Equation" when referring to a specific equation in the text. If equations appear in an appendix, they are numbered consecutively with the appropriate appendix letter; e.g., (A-1), (A-2), etc.

## RUNNING HEADS

The publication identification number forms the running head. TRs and TNs (and when appropriate, APs and MPs) carry running heads centered 1/2-in. from the top of each page. The running head is typed in the same font size and style as the text.

## **CHAPTER 2**

### **FRONT ELEMENTS OF NSWCDD PUBLICATIONS**

Front elements of NSWCDD publications appear in the following order.

- FRONT COVER
- STANDARD FORM 298
- FOREWORD
- CONTENTS
- ILLUSTRATIONS (List of)
- TABLES (List of)
- GLOSSARY (Optional)
- EXECUTIVE SUMMARY (Optional)

#### **FRONT COVER**

A front cover of a publication is prepared by the Technical Publications Branch. Information needed for front cover preparation appears on the completed Publication Review/Approval (PRA) form. (See Chapter 6). All covers are color-coded: at Dahlgren, blue for UNCLASSIFIED, green for CONFIDENTIAL, yellow for SECRET, and pink for TOP SECRET; at CSS, white for UNCLASSIFIED, blue for CONFIDENTIAL, red for SECRET, and orange for TOP SECRET. See Figure 2-1 for an example of a standard front cover.

The following destruction notice appears on unclassified, not for public release TRs, MPs, and APs, and TNs.

"DESTRUCTION NOTICE—For unclassified, limited distribution documents, destroy by any method that will prevent disclosure of contents or reconstruction of the document."

#### **STANDARD FORM 298**

##### **Purpose**

SF 298 is used by DTIC to prepare announcements, bibliographies, and data banks. The primary objective of this form is to simplify recording descriptive and subject cataloging data for all DOD activities.

### Requirements

TRs and those MPs prepared for external distribution that are not restricted from distribution to DTIC should contain an SF 298. TNs and MPs prepared for internal distribution and APs do not contain an SF 298.

### Requirements Imposed by DTIC

The function of DTIC is to acquire, store, announce, retrieve, and provide secondary distribution of scientific and technical documents. The services of DTIC are available to all components of DOD, contractors, government agencies, grantees, and others. Although DTIC does not serve the public, reports that have no security or distribution restrictions (approved for public release) are made available by DTIC to the National Technical Information Service, a Department of Commerce activity.

### Abstract

An abstract presents a concise statement of the purpose, scope, and major findings of the report. Because abstracts are also published by abstracting services to assist potential readers in determining whether they may be interested in the report, an abstract must be understandable and independent of the rest of the report. It must contain no undefined symbols and make no reference by number to references, illustrations, tables, or appendixes. In Block 20, show "SAR" unless the abstract is approved for public release, then show "UL."

### Page Numbering

The SF 298 is located after the front cover and is numbered i/ii. See Figure 2-2 for an example of an SF 298.

### FOREWORD

The foreword is the vehicle for release of the publication. The foreword may include the following information.

- Funding or sponsorship
- Purpose of study reported
- Relationship of the publication to other publications
- Reviewers
- Acknowledgements
- Background information
- Previous milestones
- Credit for copyrighted material



### Requirements

Publications must include a foreword that is signed in black ink by the approving official. The foreword is usually one page in length. See Figure 2-3 for an example of a foreword page.

### Page Numbering

The foreword page is numbered iii/iv if an SF 298 is included in the report; otherwise, the page number is i/ii.

## CONTENTS

### Purpose

The table of contents presents the titles of each major chapter/section or heading beginning with the body of the publication for the convenience of the reader. The title of the contents page is "CONTENTS"; do not include the words "TABLE OF".

### Requirements

Publications must include a contents. See Figure 2-4 for an example of a contents page.

### Information Contained

All the major headings in the body of the publication and the titles of the appendixes appear on the contents page. It is not necessary to list headings below second order. (For further information on the order of headings, see Chapter 3.) The elements in the front of the publication are not included in the contents; however, the elements in the back of the publication are included in the contents.

### Format

The format is normally single-spaced but may be double-spaced to present a more balanced appearance if the contents is brief. Entries should be full caps (e.g., if the first- and second-order headings are all caps, then they should be listed that way in the contents). Either 10- or 12-point font size can be used. If the contents is more than one page, "CONTENTS (Continued)" appears at the top as a first-order heading for each additional page.

### Page Numbering

The contents page begins with the lowercase Roman numeral v if an SF 298 is included in the report; otherwise, the page number begins with iii.

## ILLUSTRATIONS AND TABLES

### Purpose

The list of illustrations (i.e., figures) and tables provide the titles and page locations of illustrations and tables included in the text [and appendix(es), if desired]. The titles of the lists are "ILLUSTRATIONS" and "TABLES"; do not include the words "LIST OF".

### Requirements

Illustrations and tables must be listed if there are at least five entries. See Figure 2-5 for examples of lists of illustrations and tables.

### Information Contained

In every case, these lists show

- Illustrations or table number
- Full title (exactly as it appears on the illustration or table)
- Classification of the title (in a classified publication)
- Page numbers on which the illustration or table begins (There is no need to list multiple parts of an illustration or table.)

### Format

The format is normally single-spaced, but may be double-spaced to present a balanced appearance if the list is brief, as shown in Figure 2-5. The lists may be combined with each other or with the contents page. Entries should be either full caps or initial caps depending on the format of the captions in the text. Either 10- or 12-point font size can be used. Periods are not used after figure or table numbers in the lists of illustrations or tables. If the lists are more than one page, each continuation page must repeat the title followed by "Continued" in parentheses and the column headings.

### Page Numbering

Illustration and table pages are continued sequentially in lowercase Roman numerals after the contents page.

## GLOSSARY (Optional)

### Purpose

A glossary defines abbreviations, acronyms, and symbols used in the publication. Figure 2-6 is an example of a glossary page.

### Requirements

A glossary is not mandatory for NSWCDD publications; however, if the list will aid the reader, it should be provided.

### Order of Elements in the List

The glossary entries should be listed in the following order and alphabetized: English words, Greek letters, subscripts, superscripts, and special notes.

### Reference to an Abbreviation, Acronym, or Symbol

Abbreviations, acronyms, or symbols used in the glossary must be defined (spelled out) when first mentioned in the text, with the short form following in parentheses. The short form is used thereafter.

### Format

The elements in the list may be double-spaced. Glossary continuation pages must repeat the title followed by "Continued" in parentheses.

### Page Numbering

The glossary follows the list of tables in the front elements. Pagination is continued sequentially in lowercase Roman numerals after the list of tables.

## EXECUTIVE SUMMARY (Optional)

### Purpose


An executive summary states the purpose and approach of the investigation and presents major findings, conclusions, and recommendations. It also includes a brief account of the procedures used and a concise overview. Figure 2-7 provides an example of the first page of an executive summary.

### Requirements

An executive summary is not required in NSWCDD publications. However, if a report is lengthy and technical, it can provide the reader with a quick-look summary.

### Page Numbering

The executive summary follows the glossary, or list of tables if a glossary is not used. Pagination is continued sequentially in lowercase Roman numerals after the list of tables (or glossary, if included).



**DAHLGREN DIVISION**  
**NAVAL SURFACE WARFARE CENTER**  
 Dahlgren, Virginia 22448-5100

**NSWCDD/TR-94/89**

**A DISCUSSION OF R400 AND R384 WEATHER  
 DATABASES FOR PREDICTION OF  
 NAVAL WEATHER CONDITIONS**


**BY DANIEL E. AUSTIN DR. KENNETH C. HEPFER**  
**SHIP DEFENSE SYSTEMS DEPARTMENT**

**JUNE 1994**

Distribution authorized to U.S. Government agencies only, test and evaluation (June 1994). Other requests for this document must be referred to Dahlgren Division, Naval Surface Warfare Center (Code 740), Dahlgren, VA 22448-5100.

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a. DAHLGREN



**DAHLGREN DIVISION**  
**NAVAL SURFACE WARFARE CENTER**  
 Panama City, Florida 32407-7001

**CSS/TR-94/45**

**IMAGE ENHANCEMENT FOR  
 MINE IDENTIFICATION**

**A. J. NEVIS AND DR. G. J. DOBECK**  
**COASTAL RESEARCH AND TECHNOLOGY DEPARTMENT**

**DECEMBER 1994**

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b. CSS

FIGURE 2-1. FRONT COVER

REPORT DOCUMENTATION PAGE		Form Approved OSM No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.			
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED	
	April 1995		
4. TITLE AND SUBTITLE		5. FUNDING NUMBERS	
DDG-53 Shock Trials Fiber Optic Investigation			
6. AUTHOR(s)		7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	
Daniel D. Thomas		Naval Surface Warfare Center Dahlgren Division (Code B35) 17320 Dahlgren Road Dahlgren, VA 22448-5100	
8. AUTHOR(s)		9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	
		Office of Naval Technology	
10. SPONSORING/MONITORING AGENCY REPORT NUMBER		11. SUPPLEMENTARY NOTES	
12a. DISTRIBUTION/AVAILABILITY STATEMENT		12b. DISTRIBUTION CODE	
Distribution authorized to U.S. Government agencies only; test and evaluation (April 1995). Other requests for this document shall be referred to Dahlgren Division, Naval Surface Warfare Center (Code B35), Dahlgren, VA 22448-5100.			
13. ABSTRACT (Maximum 200 words)			
<p>The implementation of fiber distributed data interface local area networks (LANs) onboard U.S. Navy ship forces will begin with the tactical graphics capability (TGC). The TGC system components have been environmentally tested and qualified for Navy shipboard use; however, there is no data to date on how this system will function in an actual shipboard shock environment.</p> <p>This report documents the comprehensive monitoring and data analysis of a TGC LAN and links comprised of fiber-optic components during the shock events of the USS John Paul Jones (DDG-53) shock trials.</p>			
14. SUBJECT TERMS		15. NUMBER OF PAGES	
Multimode Components Local Area Network (LAN) Fiber Distributed Data Interface (FDDI) Fiber-Optic Data Multiplex System (FODMS)		35	
16. PRICE CODE		17. SECURITY CLASSIFICATION	
		UNCLASSIFIED	
18. SECURITY CLASSIFICATION OF THIS PAGE		19. SECURITY CLASSIFICATION OF ABSTRACT	
UNCLASSIFIED		UNCLASSIFIED	
20. LIMITATION OF ABSTRACT		21. LIMITATION OF ABSTRACT	
SAR		SAR	
NSN 7540-01-280-5500		Standard Form 298 (Rev. 2-89) Prescribed by ANSI Std. Z39-18	

a. DAHLGREN

REPORT DOCUMENTATION PAGE		Form Approved OSM No. 0704-0188	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing this collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.			
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE	3. REPORT TYPE AND DATES COVERED	
	April 1994		
4. TITLE AND SUBTITLE		5. FUNDING NUMBERS	
Review of Criteria for Target Discrimination in Images			
6. AUTHOR(s)		7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)	
C. A. Guillebeau and C. J. Robertson		Naval Surface Warfare Center Dahlgren Division (Code B35) 17320 Dahlgren Road Dahlgren, VA 22448-5100	
8. AUTHOR(s)		9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	
		Office of Naval Technology	
10. SPONSORING/MONITORING AGENCY REPORT NUMBER		11. SUPPLEMENTARY NOTES	
12a. DISTRIBUTION/AVAILABILITY STATEMENT		12b. DISTRIBUTION CODE	
Distribution authorized to U.S. Government agencies only; test and evaluation (April 1994). Other requests shall be referred to Coastal Systems Station, Dahlgren Division, Naval Surface Warfare Center (Code B35), Dahlgren, VA 22448-5100.			
13. ABSTRACT (Maximum 200 words)			
<p>A literature search was performed to assess previous work done on the relationship between image quality and observer performance. The specific application of interest is underwater acoustic minehunting. A bibliography of relevant articles is provided. As the results of each investigation are dependent on its particular assumptions and conditions, comparison is difficult, if not impossible. An overall conclusion as to required image quality for improved minehunting capability was not reached. It is recommended that the U.S. Navy explore this matter by conducting carefully controlled, realistic experiments.</p>			
14. SUBJECT TERMS		15. NUMBER OF PAGES	
Images, image quality, human performance, target discrimination		35	
16. PRICE CODE		17. SECURITY CLASSIFICATION	
		UNCLASSIFIED	
18. SECURITY CLASSIFICATION OF THIS PAGE		19. SECURITY CLASSIFICATION OF ABSTRACT	
UNCLASSIFIED		UNCLASSIFIED	
20. LIMITATION OF ABSTRACT		21. LIMITATION OF ABSTRACT	
SAR		SAR	
NSN 7540-01-280-5500		Standard Form 298 (Rev. 2-89) Prescribed by ANSI Std. Z39-18	

b. CSS

FIGURE 2-2. SF 298

NSWCDD/TR-94/89

FOREWORD

Many U.S. Navy programs have a strong need to be able to make predictions of forward looking infrared (FLIR) camera performance against various threats. An important factor in calculating performance ranges is the atmospheric transmission. Weather information previously combined into databases known as the *Random 400* and the *Random 384* (or R400 and R384) was processed into a form that would allow simple estimates of the atmospheric transmission at any given range. This report describes these two databases and the infrared atmospheric transmission modeling that was done using them.

This report has been reviewed by Roger Carr, Head, Electro-Optical Systems Branch and Stuart Koch, Acting Head, Search and Track Division.

Approved by:

THOMAS C. PENDERGRAFT, Head  
Ship Defense Systems Department

FIGURE 2-3. FOREWORD

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FIGURE 2-4. LIST OF CONTENTS

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## b. DOUBLE-SPACED

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## a. SINGLE-SPACED

FIGURE 2-5. LIST OF ILLUSTRATIONS AND TABLES



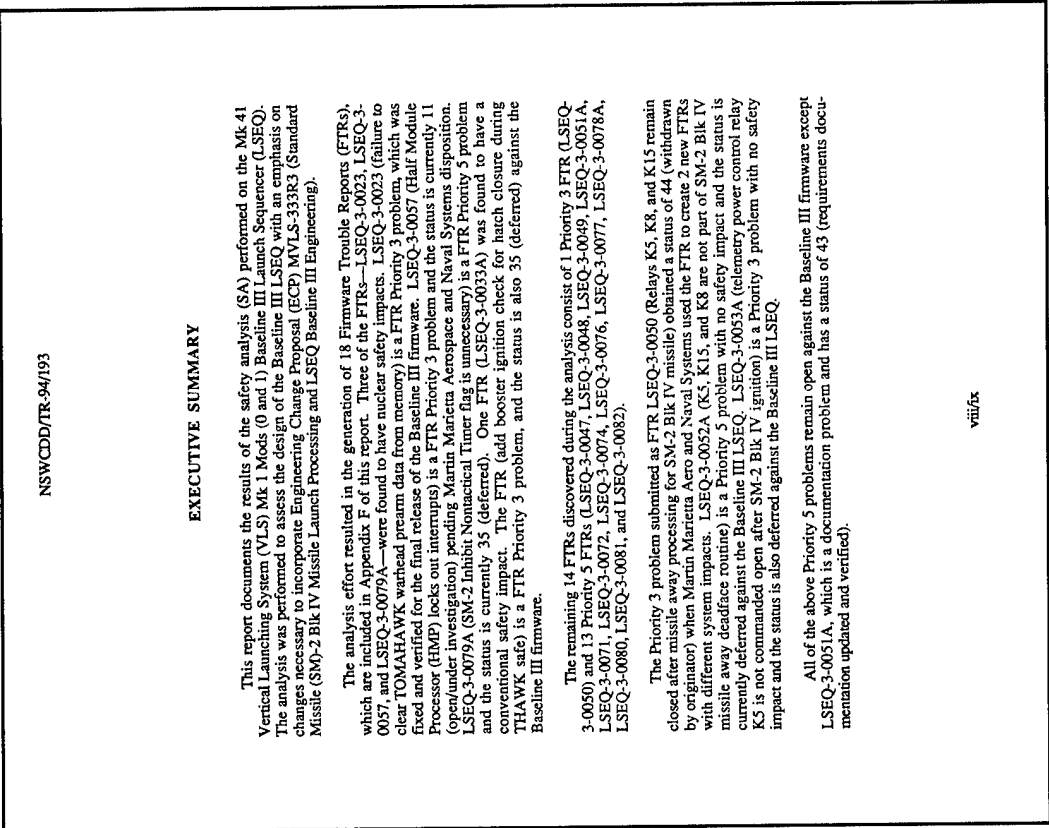


FIGURE 2-7. EXECUTIVE SUMMARY

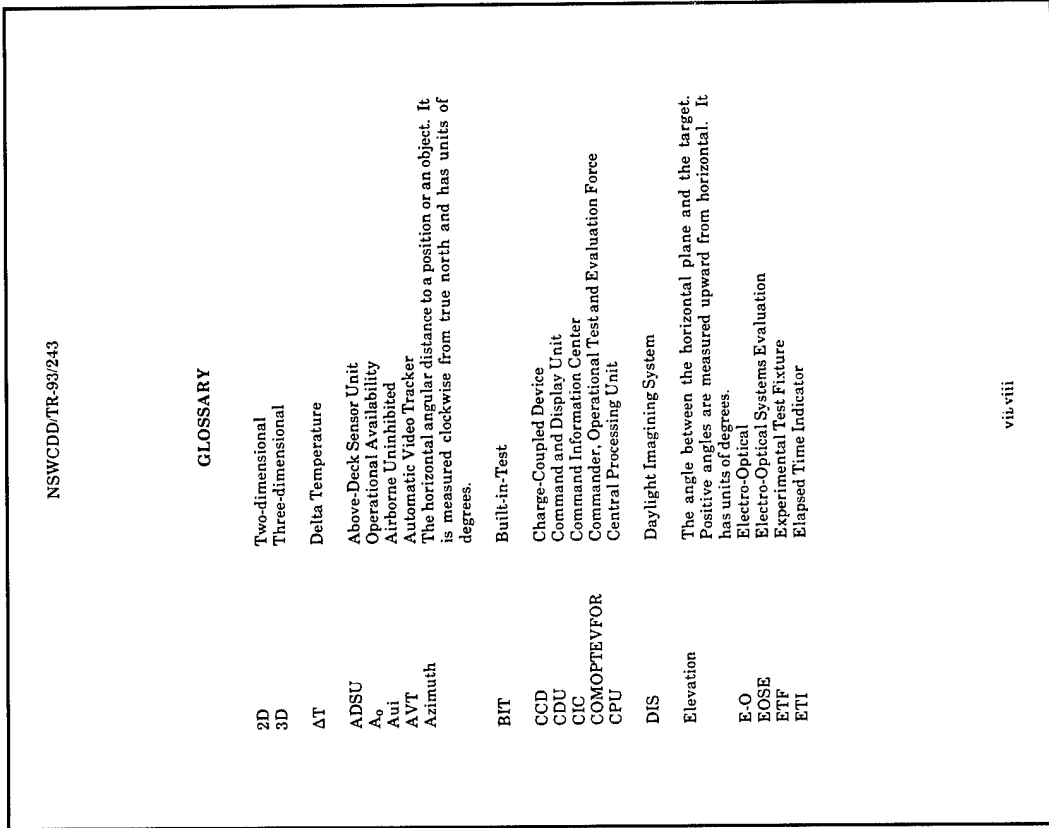


FIGURE 2-6. GLOSSARY

## CHAPTER 3

### MAIN BODY OF NSWCDD PUBLICATIONS

#### MAIN BODY

Arrangement of material within the body of NSWCDD publications is largely the author's choice; however, TRs will usually include the following:

- **SUMMARY (Optional)**—A synopsis of the report.
- **INTRODUCTION**—Statement of the problem, background information, scope, or purpose and objectives of the investigation.
- **TEXT**—Description of the technical effort (experimental procedures, equipment and facilities, tests performed, etc.) and results achieved.
- **CONCLUSIONS**—Evaluation of the results.
- **RECOMMENDATIONS**—Recommended actions, solutions to problems, or further study.
- **REFERENCES (Optional)**—Numerical listing of references used in the publication.
- **BIBLIOGRAPHY (Optional)**—Alphabetical listing of sources used for the publication.

#### HEADINGS

##### Requirements

No specific format for first-, second-, third-, or fourth-order headings is required for NSWCDD publications. However, the following standards (as shown in Figure 3-1) are recommended.

**First-Order Heading.** First-order headings are typed with full caps, bold, and are centered on the page. A heading of two lines or more is typed in an inverted pyramid, with the top line no longer than 4 inches. (Chapter/section titles, if used, are first-order headings.) The initial first-order heading has five spaces preceding it; all subsequent first-order headings have three spaces preceding them. There should be two blank lines after the first-order heading before the text. If a report has small sections with no chapter/section numbers, first-order headings do not have to start a new page; they can be placed immediately following a paragraph.

Second-Order Heading. Second-order headings are typed with full caps and are flush left on the page, with no period. Two or more lines may be used if necessary, with all lines beginning flush left. Two blank lines should precede the second-order heading, and one blank line should follow it.

Third-Order Heading. Third-order headings are typed flush left with initial caps and are underlined, with no period. Two blank lines should precede the third-order heading, and one blank line should follow it before the text.

Fourth-Order Heading. Fourth-order headings are typed indented with initial caps, underlined, and are followed by a period and two spaces. One blank line should precede the fourth-order heading. The text begins on the same line as the heading.

### Numbering

Use numbered headings only when needed for clarity because of the length or complexity of the report. If numbering is required, it should be decimal style and limited to four levels (e.g., 3.0, 3.1, 3.1.1, 3.1.1.1).

### FOOTNOTES

A footnote comments on, explains, or interprets information presented in the text. They are referred to in the text in the following sequence: asterisk (\*), double asterisk (\*\*), dagger (†), and double dagger (††). Footnote symbols in the text follow any punctuation marks except the dash; e.g., "...scientific methodology;\*...." Wherever possible, the footnote symbol should come at the end of a sentence or clause.

### Placement on Page

Footnotes are typed at the bottom of the page on which they are cited in the order in which they are mentioned in the text. A footnote cutoff rule (e.g., a line approximately 1 in. long) is used to separate the text and footnotes. When it is impossible to complete a footnote on the page to which it is keyed, it is continued at the bottom of the next page below the footnote cutoff rule but above any other footnotes beginning on the new page. Individual footnotes are single-spaced, with double-spacing between footnotes.

### ILLUSTRATIONS

#### Purpose

The purpose of an illustration is to supplement the text, call attention to details, and present ideas difficult to describe in writing.

#### Requirements

Illustrations for TRs and externally distributed MPs and APs can be computer generated by the author or prepared by the Visual Information Branch to ensure consistency and high quality.

Illustrations for TNs and internally distributed MPs and APs can be the responsibility of the author. (Illustrations cannot be handwritten.) Ensure that the illustrations use the same language, terminology, units, etc., as used in the text.

### Page Location

Illustrations follow their first text reference (on the same page or on a separate page) or they are grouped in numerical sequence at the end of the text or at the end of a chapter/section. Illustration continuation pages should repeat the illustration number and caption (title) followed by "Continued" in parentheses.

### Numbers and Captions

Illustration numbers and captions (title) appear below all illustrations. They are numbered consecutively throughout the report; however, if the publication is compound-numbered to identify chapters or sections, the illustrations are compound-numbered, as shown in Figure 3-2a. The caption should not extend beyond the margins of the illustrations. If the caption is more than one line long, subsequent lines are either flush with the first character in the caption or centered and single-spaced. Captions can be typed full caps or initial caps (format used must be consistent throughout publication), in 10-point, with a period and two spaces after the illustration number. If descriptive legends are used to explain symbols, etc., they should not be part of the caption.

### Position on Page

Every effort should be made to place illustrations on the page so that the publication does not have to be turned. If an illustration must be placed sideways on a page, turn it horizontal, or landscaped, so that the bottom is at the right margin of the page, as shown in Figure 3-2b. More than one illustration may be placed on a single page.

### Reference to Illustrations

Each illustration must have a text reference. Text references are shown in one of the following ways:

"As shown in Figure 5, the..."

"All illustrations and tables must have a caption (see Figure 5)."

Spell out and initial cap "Figure" when referring to a specific one in the text.

### Spacing

If illustrations are to be inserted in the text, at least two lines of spacing appear between the text and illustrations (including captions).

### Foldouts

Foldouts should be avoided whenever possible. Foldouts are specialty items, and it is recommended that you obtain guidance from the Technical Publications Branch.

### Photographs

Color photographs can be used. All photographs should be mounted by the Visual Information Branch. Previously printed photographs should not be used as original copy. Line drawings are preferable to photographs of marginal quality. If color photographs are used back-to-back, the page numbering needs to be adjusted. For example, the first color photograph page would be numbered "1/2," the second one would be "3/4." Page numbering continues sequentially on all noncolor photograph pages.

### Color Illustrations

Color illustrations can be used in a publication when color deviation is required. The current color copying process does not allow color on both sides of the page; however, text may be used on the opposite side. The color illustrations will be reproduced xerographically (not printed). If color illustrations are used back-to-back, page numbering is the same as that for back-to-back color photographs.

## TABLES

### Purpose

A table is a systematic, condensed presentation of data for ready reference.

### Requirements

All tables must be typed.

### Page Location

Tables are placed following their first text reference (on the same page, as shown in Figure 3-3a, or on a separate page) or they are grouped in numerical sequence at the end of the text, following any illustrations that are likewise grouped. (If the illustrations are grouped at the end, the tables must also be grouped.) Table continuation pages should repeat the table number and caption followed by "Continued" in parentheses and all column headings.

### Numbers and Captions

Table numbers and captions (titles) appear above all tables. Tables are numbered consecutively throughout the report; however, if the publication is compound-numbered to identify chapters or sections, the tables must be compound-numbered also, as shown in Figure 3-3a. The

caption should not extend beyond the margins of the table. If the caption is more than one line long, subsequent lines are single-spaced and are either flush with the first character in the caption or centered. Captions can be typed full caps or initial caps (format used must be consistent throughout the publication and consistent with illustrations) with a period and two spaces after the table number.

### Position on Page

Every effort should be made to arrange a table on the page so that the publication does not have to be turned. When a table must be placed sideways on a page, turn it horizontal, or landscaped, so that the bottom is at the right margin of the page, as shown in Figure 3-3b. More than one table may be placed on a single page.

### References to Tables

Each table must have a text reference. Text references are shown in one of the following ways:

"As shown in Table 5, the..."

"All test shots were compared after the first day (see Table 5)."

Spell out and initial cap "Table" when referring to a specific one in the text.

### Spacing

A table is single-spaced unless double-spacing presents a more balanced page. Double-spacing may be used between major sections, as shown in Figure 3-3b. If a table is to be inserted in the text, at least two lines of spacing appear between the text and table (including caption).

### Column Headings

Column headings in a table may be initial caps or full caps, centered above the columns.

## REFERENCES (Optional)

### Purpose

The list of references presents the source documents referred to in the body of the publication. Classified documents are not to be listed in unclassified, unlimited distribution publications (see SECNAVINST 5510.34).

### Reference Call Outs

References are made to specific books, reports, journals, and similar documentation used by the author. References are numbered consecutively in the order in which they appear in the text. They are referred to in the text with a superscript numeral or "in Reference 1" and never

followed by a period or slash mark, or enclosed in parentheses or brackets. Wherever possible, the superscripted reference number should come at the end of a sentence or clause. They are cited numerically in a list following the text of the report. However, if less than three references are cited, they may be placed at the bottom of the page on which they are called out.

#### Page Location

The list of references appears at the end of the main body of the publications. In a publication with both a list of references and a bibliography (a rare occurrence), the list of references precedes the bibliography. References begin on a separate page from the rest of the text.

#### Page Numbering

Pagination continues consecutively with the main body.

#### Title

In titling the list of references, do not include the words "LIST OF."

#### Format

References are listed in numerical order. No specific format is required for references in NSWCDD publications; however, the punctuation and order of elements shown in Table 3-1 is recommended. If the order of elements shown is not used, all references must contain complete information. Each entry is single-spaced with double spacing between entries, as shown in Figure 3-4. Reference continuation pages must repeat the title followed by "Continued" in parentheses.

#### **BIBLIOGRAPHY (Optional)**

#### Purpose

A bibliography lists the documents consulted by the author, whether or not they are referenced in the text. Classified documents are not to be listed in unclassified, unlimited distribution publications (see SECNAVINST 5510.34).

#### Requirements

A bibliography is not required in NSWCDD publications.

#### Page Location

The bibliography appears after the list of references and before the appendixes, if any.

Page Numbering

Pagination continues consecutively with the main body.

Format

Bibliographic entries are listed in alphabetical order according to the first letter of the entry. No specific format is required for a bibliography in NSWCDD publications; however, the punctuation and order of elements shown in Table 3-1 are recommended. If the order of elements shown is not used, all entries must contain complete information. The format used must be the same format used in the references. Each entry is single-spaced with double spacing between entries, as shown in Figure 3-5. Bibliography continuation pages must repeat the title followed by "Continued" in parentheses.



NSWCDD/MP-95/67

**FIRST-ORDER HEADING\***

First-order headings are typed with full caps, bold, and are centered on the page. A heading of two lines or more is typed in an inverted pyramid, with the top line no longer than 4 inches. (Chapter/section titles, if used, are first-order headings.) The initial first-order heading has five spaces preceding it; all subsequent first-order headings have three spaces preceding them. There should be two blank lines after the first-order heading before the text. If a report has small sections with no chapter/section numbers, first-order headings do not have to start a new page; they can be placed immediately following a paragraph.

**SECOND-ORDER HEADING**

Second-order headings are typed with full caps and are flush left on the page, with no period. Two or more lines may be used if necessary, with all lines beginning flush left. Two blank lines should precede the second-order heading, and one blank line should follow it.

**Third-Order Heading**

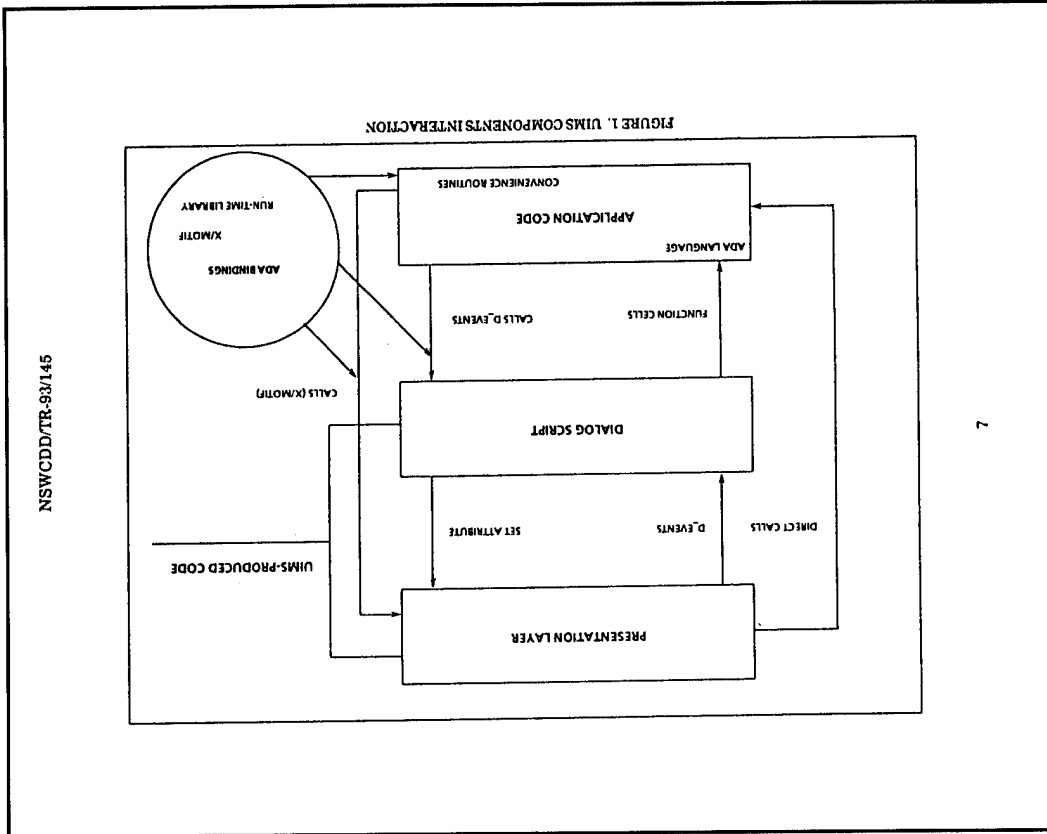
Third-order headings are typed flush left with initial caps and are underlined, with no period. Two blank lines should precede the third-order heading, and one blank line should follow it.

**Fourth-Order Heading.** Fourth-order headings are typed indented with initial caps, underlined, and are followed by a period and two spaces. One blank line should precede the fourth-order heading. The text begins on the same line as the heading.

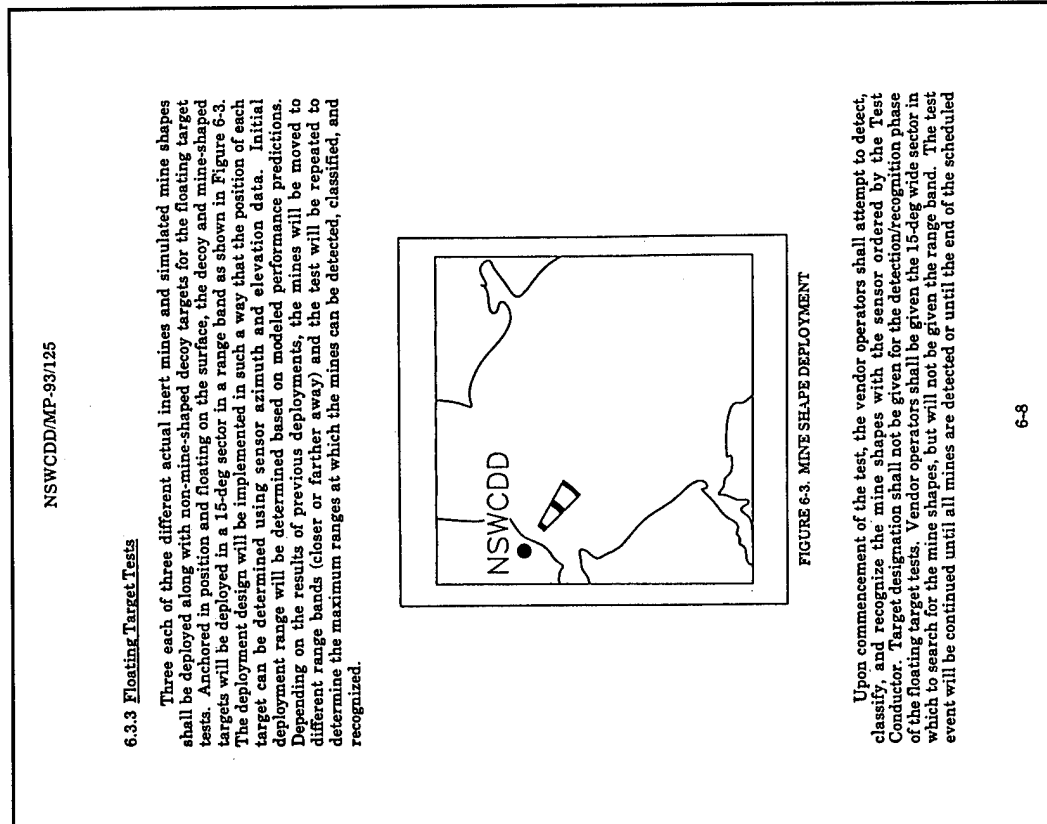
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\* No specific format for first-, second-, third-, and fourth-order headings is required for NSWCDD publications. However, the standards presented (as shown in Figure 3-1) are recommended.

FIGURE 3-1. SAMPLE HEADINGS LAYOUT



b. HORIZONTAL LAYOUT



a. VERTICAL LAYOUT

FIGURE 3-2. ILLUSTRATIONS

Test Case	Replan 1 (AR-1)	C	Replan AC-1	Same target, different aim point	None	Special Procedures
Objective	Replan 2 (AR-2)	D	Replan AC-2	Same target complex, modified target segment	None	
	Replan 3 (AR-3)	D	Replan AC-3	Different target segment	None	
	Replan 4 (AR-4)	C	Replan AC-4	Change missile variant	None	
	Replan 5 (AR-5)	D	Replan AC-5	Additional target segment	None	
	Replan 6 (AR-6)	D	Replan AC-6	Change DAY TYPE to HOT	None	
	Replan 7 (AR-7)	C	Replan AC-7	Change threat location	Do not derive data. Reroute interactively as required. The Route Assessment Results Summary may be used to determine changes.	
	Replan 8 (AR-8)	D	Replan AC-8	Change missile OP	None	
	Replan 9 (AR-9)	C	Replan AC-9	Same target, different launch area	Change munitions type	
	Replan 10 (AR-10)	D	Replan AC-10	None	None	

TABLE 3.6. APS REPLANNING TEST CASES

b. HORIZONTAL LAYOUT

- Test event title, number, date, and time
- Name of individual filling out data sheet and assigned station
- List of personnel participating in each test event, including assigned duty stations
- Target type and configuration
- Environmental data listed in Table 7-1 obtained from test personnel and NSWCDD range instrumentation
- Test data not subject to automatic collection
- Configuration of the vendor equipment including any changes incorporated since the previous test
- Unique identification numbers of all magnetic video, audio, digital, and other tapes and data media used during the specific test period

TABLE 7-1. ENVIRONMENTAL DATA

Data Item	Rate
Range Time Tag	Each Measurement
Cloud Cover	Pre/Post Test
Sea State (River State)	Pre/Post Test
Visibility	Every Minute
Air Temperature	Every Minute
Relative Humidity	Every Minute
Dewpoint	Every Minute
Air Pressure	Every Minute
Surface Wind Speed	Every Minute
Surface Wind Direction	Every Minute

7.1.4.2 Video Data. Identical TV format video tape recorders shall be used to record the video image and symbology presented to the operators. In addition, the raw video (no symbology) from a single TIS and a single TV camera per vendor shall be recorded.

7.1.4.3 Digital Data. Digital data from the vendors' systems and selected STSTS equipments shall be recorded. Table 7-2 lists the minimum set of data parameters to be collected from the vendor systems. Additional data parameters can be added, up to the limit of NSWCDD data recording equipment, by mutual agreement between the vendor and NSWCDD. Table 7-3 lists the set of data parameters to be collected from the STSTS facilities during testing.

a. VERTICAL LAYOUT

FIGURE 3-3. TABLES

NSWCDD/TR-93/243

## REFERENCES

1. *Electro-Optical Systems Evaluation Program Master Plan*, NSWCDD/MP-93/125, Mar 1993, Dahlgren, VA.
2. *Electro-Optical System Evaluation Questionnaire*, TRW, Proposal, 19 Feb 1993.
3. *System Specification for Optical Sight EX 46 Mod 0*, NSWCDD, System Specification, WS 32735, 1 Jun 1989.
4. George, E. *FLIR Performance Assessment Against Selected U.S. Navy Targets* (Working Papers), 17 Jun 1992, Dahlgren, VA.
5. "Implications to Naval Warfare," *Optical Spectrum Domination Symposium*, Director, Naval Surface Warfare Division, 29-30 Mar 1993.
6. OPNAVINST 3000.12, *Operational Availability*.
7. *Questionnaire-Land-Based Evaluation of Electro-Optical Tracking Sensor Systems*, Kollmorgen Corporation, Proposal, 19 Feb 1993.
8. *Land-Based Evaluation of Electro-Optical Tracking Sensor Systems*, Loral Defense Systems-Akron, Proposal, 19 Feb 1993.
9. MIL-HDBK-472, *Maintainability Prediction*.
10. MIL-STD-781, *Reliability Testing for Engineering Development, Qualification, and Production*.
11. MIL-STD-721, *Definition of Terms for Reliability and Maintainability*.

FIGURE 3-4. REFERENCES

NSWCDD/TR-92/199

## SECTION 4.0. BIBLIOGRAPHY

- Defense System Software Development, DOD-STD-2167A, 29 Feb 1988.
- Documentation of the Mission Planning Process*, CMSAINST 3330.1F, USCINCLANT CMSA, 25 Nov 1991.
- Modified Interface Requirement Specification for the Digital Scene Matching Area Correlation (DSMAC) IIA ANYDXQ-1 (V) Theater Mission Planning Center Upgrade (TMPCU) 1.0 Interface (U)*, JCN-2084, 28 Feb 1990 (SECRET).
- Naval Surface Warfare Center Publications Guide*, NSWCDD/MP-92/2, Jan 1992, NSWCDD, Dahlgren, VA.
- Prime Item Development Specification (PIDS) for the DIWS/DIWS(A)*, EDM Rev B, 6 Jun 1991.
- Software Test Plan for the DT-IIA Testing of the Theater Mission Planning Center Upgrade (TMPCU) and the DT-IIIB Testing of the Afloat Planning System (APS)*, T-SPN-0331-00, Nov 1991.
- Software User's Manual for the Digital Imagery Workstation Suite (DIWS)*, Shared Resource (SR), CSCI, Image Data Input (IDI) CSCI, and Image Data Storage (IDS) CSCI, DM-90-335, Books 1-3, 1 Aug 1991.
- Software User's Manual for the TOMAHAWK Land Attack Missile Mission Planning System and the TOMAHAWK Land Attack Missile Mission Planning System Afloat (U)*, MDC B008/A00A, Vol I-IV, Rev A, 15 Jan 1992 (SECRET).
- System Specification for the Theater Mission Planning Center (TMPCU) (U)*, PDA-14 P3900/2B, 8 Jan 1990 (SECRET).
- Test and Evaluation Master Plan (TEMP) (U)*, OPNAV TEMP No. 1007-1, Rev A, Draft, Mar 1991 (CONFIDENTIAL).
- Trainee Guide for the Tomahawk Land Attack Missile (TLAM) Planning System Mission Planner Module (U)*, MDC C007, Vol I-IV, 25 Apr 1992 (SECRET).

4-1

FIGURE 3-5. BIBLIOGRAPHY

TABLE 3-1. RECOMMENDED FORMAT FOR REFERENCES

Citation	Order of Elements	Example
Book	Author Title Edition Publisher Location Date Pages Cited	Urick, R. J., <i>Principles of Underwater Sound for Engineers</i> , Second Edition, McGraw Hill Book Co., Inc., New York, NY, 1967, pp. 820-1121.
Computer Program	Program Name Source (Including Department) Date	STUMPM Computer Program, NSWC, Research and Technology Department, 1985.
Contractor-Prepared Report (Classified)	Author Title Report Number Company Location Date Pages Cited Security Classification	Fried, D. L., <i>Adoption of Thick Chopper Wave Front Sensor Hardware for Operations as a Shewing Interferometer (U)</i> , NSWC TR 86-510, Optical Sciences Company, Placentia, CA, Jan 1979, pp. 63-68 (CONFIDENTIAL).
Dissertation	Author Title Dissertation University Date	Santopietro, R. F., <i>Measurement, Analysis, and Reduction of Noise in High-Frequency Electrocardiogram</i> , Ph.D. Dissertation, University of Pennsylvania, Dec 1982.
Drawing	Source Drawing Number Title Date	NSWC, Dwg. No. 9384, "Schematic of Different Analysis for Determining Structural Response of Ship Deck Under Impulsive Loads," 14 Oct 1984.
Edited Book	Editor Title Publisher Location Date	Eshback, W., Ed., <i>Handbook of Engineering Fundamentals</i> , John Wiley & Sons, Inc., New York, NY, 1980.
Foreign Journal Article	Author Title of Article Title of Journal Volume Date	Gassmand, F., "Über die Elastizität Medien," <i>Naturforschende Gesellschaft, Zurich Vierteljahresschrift</i> , Zurich, Vol. 96, 1972.
Instruction	Agency Number Date Subject Location	OPNAVINST 5510.1H of 29 Apr 1988, Subj: <i>Department of the Navy Information and Personnel Security Program Regulation</i> , Washington, DC.
Journal Article	Author Title of Article Title of Periodical Volume Date Pages Cited	Marsh, H. W.; Simons, T.; and Schulkin, M., "Sound Absorption in Seawater," <i>Acoustical Society of America Journal</i> , Vol. 34, No. 6, 1962, p. 864.

NOTE: Titles may be typed in italics (as shown in the examples) or underscored. References for unclassified publications are typed exactly as those for classified publications except that security markings do not appear. If an unclassified reference is cited in a classified publication, add (UNCLASSIFIED) to the end of the reference.

TABLE 3-1. RECOMMENDED FORMAT FOR REFERENCES (Continued)

Citation	Order of Elements	Example
Letter	Originator Desk Letters File Number Serial Number Date Subject Addressee Location	JAB ltr 001:RKL:ds 5050 Ser 4522 of 7 Dec 1985, Subj: Laboratory Environmental Evaluation of the Infrared Motion Detector, to NAVSEA, Washington, DC.
Memorandum	Source Subject City State Date	NSWC H31 Memo, Subj: Laboratory Environmental Evaluation of the Infrared Motion Detector, Dahlgren, VA, 12 Apr 1985.
Message (Classified)	Sender Date/Time Group Month/Year Addressee Location Security Classification	CNO Msg 052016A Sep 1991 to NAVSWC/WO (CONFIDENTIAL).
Navy Manual (Classified)	Title and Security Classification Symbol Number Volume Part Revision Date Pages Cited Security Classification of Manual	<i>Troubleshooting Test Set, Automatic, MK 591 MOD 2 (U)</i> , NAVSEA OP 4374, Vol. 3, Part 1, Rev. 1, 15 Sep 1989, pp. 51-64 (CONFIDENTIAL).
Patent	Inventor Title Country Patent Number Date	Adolph, H. G., "Acetals Derived from Negatively Substituted Aldehydes and Polynitro- or Halonitroethanols," U.S. Patent No. 4062897, 13 Dec 1977.
Personal Communication	First Person in Communication Type of Communication Second Person in Communication Title (if any) and Organization (city and State) Subject Discussed Date	Finkle, K. R., Telephone Conversation with J. R. Jones, Head Explosives Branch, Lockheed Missile & Space Co., Inc., Palo Alto, CA, Concerning Finite Element Techniques, 18 May 1990.

NOTE: Titles may be typed in italics (as shown in the examples) or underscored. References for unclassified publications are typed exactly as those for classified publications except that security markings do not appear. If an unclassified reference is cited in a classified publication, add (UNCLASSIFIED) to the end of the reference.

TABLE 3-1. RECOMMENDED FORMAT FOR REFERENCES (Continued)

Citation	Order of Elements	Example
Proceedings (Classified)	Author Title and Security Classification Symbol Proceedings Location Date Pages Cited Security Classification of Proceedings	Smith, J. J. and Jones, A. P., "Supersonic Stores Separation Technology (U)," in <i>Proceedings of the Ninth Navy Science Symposium</i> , U.S. Naval Academy, Annapolis, MD, 28 Oct 1974, pp. 17-30 (SECRET).
Specification	Source Type of Specification Specification Number Title Date	NSWC, Process Specification, WS 19604, <i>Fabrication of the Fiberglass Bomblet Assembly</i> (504109), 18 Apr 1979.
Technical Report (Classified)	Author Title and Security Classification Symbol Report Number Date Location Security Classification of Report	Tipton, R. G., et al., <i>Development of a PRAM Case Stabilization System (U)</i> , NAVSWC TR 91-194, Dec 1991, NAVSWC, Dahlgren, VA (CONFIDENTIAL).
Unpublished Paper	Author Title Location Date	Simons, T. V., "SUBROC Mine Development Conference," NWC, China Lake, CA, 30 Jun 1974.

NOTE: Titles may be typed in italics (as shown in the examples) or underscored. References for unclassified publications are typed exactly as those for classified publications except that security markings do not appear. If an unclassified reference is cited in a classified publication, add (UNCLASSIFIED) to the end of the reference.

## CHAPTER 4

### BACK ELEMENTS OF NSWCDD PUBLICATIONS

Back elements of NSWCDD publications appear after the text in the following order.

- APPENDIXES (Optional)
- INDEX (Optional)
- DISTRIBUTION
- BACK COVER

#### APPENDIXES (Optional)

##### Purpose

An appendix contains supplementary material that supports the main body of the publication. Appendixes are considered stand-alone documents.

##### Page Location

An appendix is placed after the body of the publication and before the distribution list. It is listed in the table of contents.

##### Page Numbering

Appendix pages are compound-numbered based on appendix designation. A title page is included at the beginning of the appendix (Figure 4-1a). The page number for the title page is, for example, A-1/A-2. The page that begins the text is then numbered A-3 (Figure 4-1b).

##### Numbers and Titles

Appendixes are designated Appendix A, Appendix B, etc. Each appendix must have a title.

##### Reference to an Appendix

Each appendix must be referenced in the text. "Appendix" is spelled out with an initial cap in the text when calling out a specific appendix. If only one appendix appears in a publication, then reference can be made to "the appendix."



### Figure, Table, and Equation Numbers

Figure, table, and equation numbers are preceded by the letter designation of the appendix in which they fall (e.g., A-1, A-2, B-1, etc.). Captions of figures and tables used in an appendix may appear in the list of illustrations and tables in the front of the publication.

### References in Appendixes

If figures, tables, or equations are mentioned in both the body of the report and an appendix, they should appear as new figures, tables, or equations in the appendix. If a reference is used in both the body of the publication and the appendix, it is treated as a new reference in the appendix, and the complete citation is repeated. If there are no references in the text, begin numbering references in a single appendix with Arabic numeral one. If there are text references, or if another appendix has references, they are compound-numbered (A-1, B-1, etc.) to conform to the appendix designation and are listed numerically following each appendix. However, if less than three references are cited, they may be placed at the bottom of the page on which they are called out.

## INDEX

### Purpose

The index alphabetically lists each topic mentioned in the publication, along with the page number(s) on which the topic is found in the text.

### Requirements

An index is not required in NSWCDD publications.

### Page Location

An index is placed at the end of the publication, before the distribution list.

### Page Numbering

Index pages are compound-numbered (e.g., IN-1, IN-2, etc.). The first page of the index must be a right-hand page.

### Format

A two-column format is used, as shown in Figure 4-2. Index continuation pages must repeat the title followed by "Continued" in parentheses.

## DISTRIBUTION

The distribution list appears at the end of the publication in front of the back cover. Although it is the author's responsibility to provide correct mailing addresses, the Technical Publications Branch will assist whenever possible. The Security Office can provide the author with approved contractor addresses, and the Mail Center can assist with the Navy addresses.

### Number of Copies for Addresses

The number of copies for each external addressee is shown at the right of the address, opposite the attention line, centered under the column heading "Copies." If there is no attention line, the number of copies should be placed to the right of the zip code, centered under the column heading "Copies." The number of copies for each internal addressee is shown to the right of the office code and/or name, centered under the column heading "Copies."

### Format

The distribution list is typed in all caps, 10-point, in the double-column format shown in Figure 4-3. External distribution addresses are single-spaced with double-spacing between addresses. The internal distribution list is single-spaced. Distribution continuation pages must repeat the title followed by "Continued" in parentheses.

### Page Numbers

The distribution list begins on a right-hand page, numbered (1), centered at the bottom of the page, as shown in Figure 4-3.

### Address Format

To be compatible with the U.S. Postal Service automation requirements, all official mail addresses will be typed or printed by other mechanical means in uppercase letters and contain no punctuation except for the hyphen in the ZIP + 4 code.

Official mail addresses (both delivery and return) will be limited to five lines, formatted with a uniform left margin, and limited to a maximum of 47 characters per line, including spaces.

Attention Line. The attention line, if applicable, appears first, as shown in Figure 4-3 and identifies a specific person or section within the activity.

ATTN	Office code(s) or specific person(s)
XXXXXXXXXXXX	Title of official in charge line
XXXXXXXXXXXX	Name of activity line
XXXXXXXXXXXX	Delivery address line
XXXXXXXXXXXX	City State ZIP + 4 code line

Title of Official in Charge Line. Navy correspondence shall be addressed to the official in charge of the activity (i.e., Director, Commander, Commanding Officer, etc.).

Name of Activity Line. When addressing DOD activities, the short title, less city and state, may be used. For example, the activity line for the Pacific Division, Naval Facilities Engineering Command would be addressed PACNAVFACENGCOM.

Delivery Address Line. This line, except for ships, will consist of either a street address, post office box number, postal service center number and box number, or unit number with or without box number.

1775 JOHN PAUL JONES BLVD  
PO BOX 405  
PSC 467 BOX 291  
UNIT 30001  
UNIT 62001 BOX 426

Street address  
Post office box number  
Post service center number and box number  
Unit number without box number  
Unit number with box number

City, State, ZIP + 4 Code Line. The post office (city), state, and ZIP + 4 code will appear in that order on the last line of the address. Except for military post office (MPO) addresses, the standard two-letter abbreviation will be used for the state. In the case of MPO addresses, Army post office (APO) or fleet post office (FPO) is used in lieu of the city and "AE" (Armed Forces Europe), "AA" (Armed Forces Americas), or "AP" (Armed Forces Pacific) is used in lieu of the state.

Civilian Post Office Address: NORFOLK VA 23511-5218

Military Post Office Addresses: APO AE 09501-4665  
APO AA 09508-0008  
FPO AP 96349-1100

Note: This addressing information was taken from OPNAVINST 5218.7A of 28 September 1992 and DOD Directive 4525.8-M of 28 September 1992.

### Required External Addresses

The following addressee must appear on the external distribution list of all reports related to R&D activities (e.g., scientific and technical reports, indexes, and progress reports of completed or current research).

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(For Dahlgren publications only)	

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The following addressees must appear on the external distribution list unless, for example, the publication contains special intelligence information that is limited in distribution or the publication is exempt from distribution to DTIC.

## Unclassified TRs and MPs for public release (Distribution Statement A):

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CAMERON STATION	
ALEXANDRIA VA 22304-6145	12
ATTN GIFT AND EXCHANGE DIVISION	4
LIBRARY OF CONGRESS	
WASHINGTON DC 20540	

## Classified and unclassified TRs and MPs with limited distribution (Distribution Statements B through X):

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ALEXANDRIA VA 22304-6145	2

Required Internal Addressees

The following addressees must appear on the internal distribution list of classified and unclassified TRs, TNs, MPs, and APs.

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E231	3
N72D or N742 (GIDEP)**	1
XXX (AUTHOR)	X

CSS PublicationsCopies

CODE E29L (TECHNICAL LIBRARY)	4
CODE 0543 (MSC)	5
CODE XXX (AUTHOR)	1

\* Add only to publications containing intelligence-related material.

\*\* Add only to unclassified TRs and MPs containing no proprietary information.

### Order of Addresses

The following is the required order for addresses on the distribution list:

**DOD ACTIVITIES (CONUS)**  
**DOD ACTIVITIES (EX-CONUS)**  
**NON-DOD ACTIVITIES (CONUS)**  
**NON-DOD ACTIVITIES (EX-CONUS)**  
**INTERNAL**

Navy Addresses. For Navy addresses, consult the Standard Navy Distribution List, OPNAV PO9B2-107 or PO9B2-105. Ships under construction may be placed on distribution lists; address "PCO" (Prospective Commanding Officer) and use the hull designation just as with any other Navy ship.

Contractor/Nongovernment Addresses. When preparing a distribution list for a classified or export controlled document that includes contractors and/or nongovernment facilities, in accordance with approved local site procedures, check to be certain that each addressee has approved safeguarding capability and is otherwise authorized to receive the information. All contractor addresses for classified mailing should be verified with the Security Office prior to publishing. In a classified publication, the attention line should read: ATTN SECURITY OFFICE FOR \_\_\_\_\_.

### **BACK COVER**

The NSWCDD logo appears on the back cover of a publication and is prepared by the Technical Publications Branch. The back cover is color coded the same as the front (see Chapter 2). Figure 4-4 provides an example of a back cover.

NSWCDD/TR-93/145

APPENDIX A  
DETAILED PORTABILITY APPROACH

A-1/A-2

a. TITLE PAGE

NSWCDD/TR-93/145

1. The most crucial area of portability between the two environments for Telesoft and Ada source code is the Telesoft Ada bindings. The Telesoft Ada bindings consist of the following ten Ada packages: BasicTypes, Ctypes, Epm, List Support, Tu, Ux, Ux Error, Ux Types, Uxa Convert and Tv.Convert. The bindings also include a procedure (Ada.Delay). The BasicTypes and Tv.Convert packages can be omitted from the port process. These packages are only utilized with the Telesoft Ada bindings.

The first step in this investigation was to verify the use of Telesoft Ada bindings source code with the Alsays compiler. The Alsays compiler should be set up to store object code in a library (refer to Alsays documentation for details). The following are the modifications that are needed to compile with the Alsays compiler:

- a. The procedure (Ada.Delay) uses the pragma EXPORT. Therefore, it should be included inside an Ada package.
- b. The package (Ux Types) uses the pragma Preserve\_Layout. The Alsays compiler does not support this feature. A record representation clause should be used in place of the pragma Preserve\_Layout. The following example is taken from the modifications of the package.

Example:

```
for X_Rectangle_Rec use
record
  X at 0 range 0 .. 15;
  Y at 0 range 16 .. 31;
  Width at 4 range 0 .. 15;
  Height at 4 range 16 .. 31;
end record;
```

NOTE: Preserve\_Layout is used to preserve a record structure during compilation for passing arguments. Both the Telesoft and Alsays Ada compilers rearrange the structure of objects defined as record types. The difference for handling records in the compilers is that Telesoft provides a pragma while (Preserve\_Layout) to prevent rearrangement of records. Alsays does not. Alsays does not provide the same information on prevention of rearrangement of record structures. A record representation can be used to prevent rearrangement of a record structure by the Alsays Ada Compiler.

2. The next step was to establish communication between the Alsays compiler and the Telesoft UIMS. Before getting started, the Alsays environment variable should be set to ADAPPS -v -c -H (Ada main

A-3

b. FIRST TEXT PAGE

FIGURE 4-1. APPENDIX



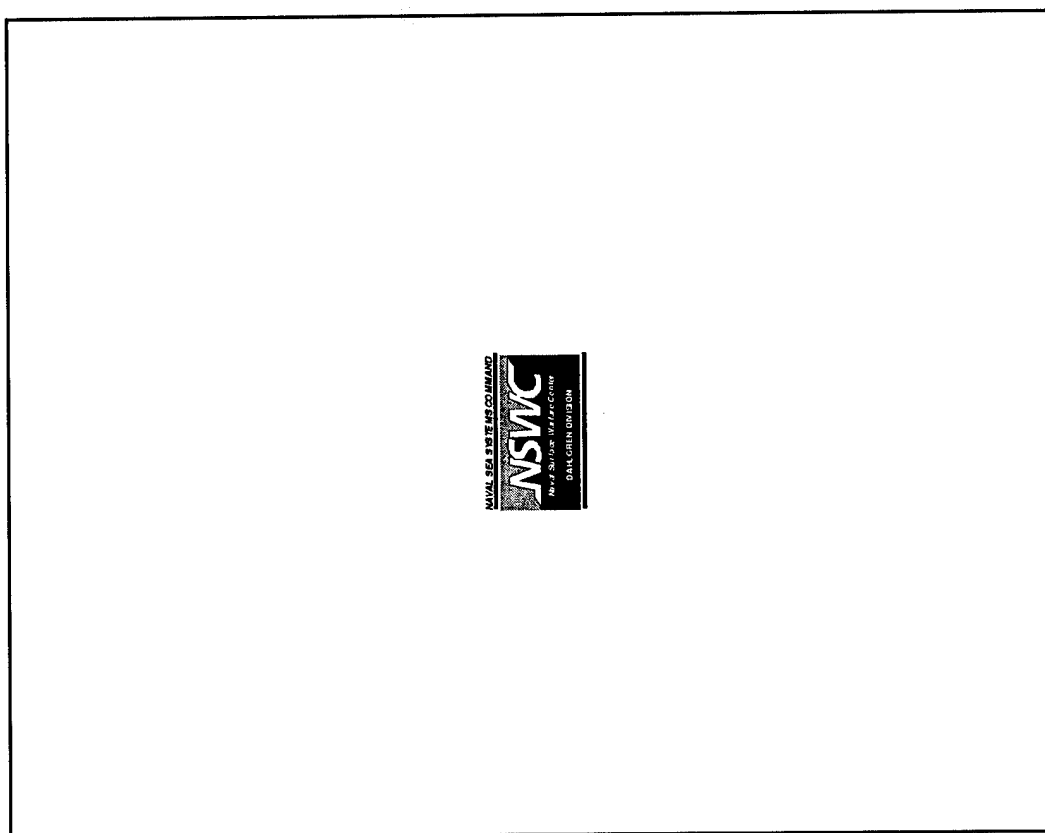


FIGURE 4-4. BACK COVER



## CHAPTER 5

### CLASSIFICATIONS MARKINGS FOR NSWCDD PUBLICATIONS

Instructions on marking the elements in classified NSWCDD publications are included in the following discussions of each element. Further details are available in OPNAVINST 5510.1H or from the Security Office.

#### FRONT ELEMENTS

##### Front Cover

General. The overall classification of the publication is centered at the top and bottom of the front cover in bold, 18-point typeface. See Figure 5-1 for an example of a classified front cover.

Publication Title. The publication title should be unclassified. A report with a classified title should be provided with an unclassified title, if at all possible. The classification of the title appears after the title.

Downgrading/Declassification Statements. With the exception of material that is Restricted Data (RD) or Formerly Restricted Data (FRD), a downgrading/declassification statement must be applied in accordance with OPNAVINST 5510.1H. The statement indicates the classifying authority (classification guide or source documents) and the declassification date, event, or Originating Agency's Determination Required (OADR). The downgrading/declassification statement will appear at the bottom left margin above the classification.

Destruction Notice. In an unclassified, limited publication, a destruction notice must appear on the front cover in accordance with OPNAVINST 5510.1H. Destruction notices appear on unclassified, not for public release TRs, MPs, APs, and TNs. A destruction notice is not needed for classified or public release publications.

Multiple Sources. If the classification of a publication is based on multiple sources (e.g., a classification guide and several source documents), only one downgrading/declassification statement appears on the cover. The words "Multiple Sources" appear on the "Classified by" line. A list of sources appears on the PRA Form. (Refer to Chapter 6 for instructions concerning the PRA Form.)

Warning Notices. Warning notices advise holders of some special status of information that requires additional protective measures. When applicable, one or more warning notices will appear prominently on the front cover written out in full text. Within the main body, in addition to classification portion markings, the abbreviated form for Restricted Data, Formerly Restricted Data, Critical Nuclear Weapons Design Information, and intelligence control markings [e.g., (S/RD), (C/FRD), (S/RD), (N), or (S/NF)] will be used. Appropriate classification markings must also appear on the appropriate paragraphs and pages of the document; warning notices do not take the place of classification markings. Some of the warning notices appear in Table 5-1.

Secondary Distribution Statement. The secondary distribution statement, used to show the intended audience and the controlling office from whom approval is required for requesters outside the intended audience, will also appear at the bottom left margin above the classification.

### Standard Form 298

The SF 298 shows the title classification, abstract classification, and classification of the subject terms. Blocks 17, 18, and 19 are self-explanatory for classification. Figure 5-2 provides an example of a classified SF 298.

### Foreword

The overall classification of the report is centered at the top and bottom of the foreword page, whether the information on the page is classified or not. The classification markings at the top and bottom of each page should be typed in 14-point and bold typeface. Each paragraph is marked at the beginning with the appropriate classification symbol in parentheses, as shown in Figure 5-3.

### Contents

The overall classification is centered at the top and bottom of each page, even if the information in the table of contents is unclassified. The classification markings at the top and bottom of each page should be typed in 14-point, bold typeface. Each entry must be followed by the appropriate classification symbol in parentheses to indicate the classification of the heading. See Figure 5-4 for an example of a contents page with classification markings.

### Illustration and Tables

The overall classification is centered at the top and bottom of each page even if the information in the list of illustrations and list of tables is unclassified. The classification markings at the top and bottom of each page should be typed in 14-point, bold typeface. Each title must be followed by the appropriate classification symbol in parentheses to indicate the classification of the figure or table title. The caption marking should appear in the same position as it does on the page where the figure or table appears. In an unnumbered figure or table, the caption will be placed immediately preceding the text of the caption. When figure or table numbers are used, the abbreviated marking is placed after the number and before the text, in the same manner as for portion markings. This will affect the location of the abbreviated marking in the list of illustrations and list of tables. See Figure 5-4 for examples.

### Glossary

The overall classification of the report is centered at the top and bottom of each page of the glossary, whether or not the information on the page is classified. The classification markings at the top and bottom of each page should be typed in 14-point, bold typeface. If the publication is classified and the entire list is unclassified, mark the heading (U) GLOSSARY (U) indicating that the list and the title are both unclassified, as shown in Figure 5-5. If any of the abbreviations, acronyms, or symbols are classified, the level of classification must be shown and the heading is marked GLOSSARY (U). The Security Office will provide guidance on the proper classification markings.

## Executive Summary

The overall classification of the publication is centered at the top and bottom of the executive summary page(s), whether or not the information in the summary is classified. The classification markings at the top and bottom of each page should be typed in 14-point, bold typeface. Each paragraph is marked at the beginning with the appropriate classification symbol in parentheses. All classification markings for executive summaries are the same as those in the text of the main body.

## MAIN BODY

### Text

Overall Classification of Each Page. The overall classification appears centered at the top and bottom of each page. However, if a warning notice appears on a page, then the top classification marking reflects the classification and warning notice; e.g., SECRET/NOFORN. The warning notices are not required to go at the bottom of the page, just the classification. The classification at the top and bottom of each page should be typed in 14-point, bold typeface, as shown in Figure 5-6.

Headings. First-, second-, and third-order headings are marked with the appropriate classification symbol in parentheses after the heading, as shown in Figure 5-6. (However, if these headings are numbered, the classification marking must appear between the number and the heading.) Fourth-order headings are marked with the appropriate classification symbol in parentheses before the heading. Unclassified headings should be used whenever possible.

Paragraphs, Subparagraphs, Parts, Sections, and Portions. Each paragraph, subparagraph, part, section, and portion must be marked with the appropriate security classification marking as shown in Figure 5-6. The appropriate symbol—(U), (C), or (S)—is set at the normal paragraph indentation, followed by one space and the first word of the paragraph, subparagraph, part, section, or portion. Other warning notices or intelligence control markings in abbreviated form applying to that portion will be included with the classification [e.g., (S/NF)]. See Table 5-1 for further information on warning notices.

Footnotes. Footnotes are marked with the appropriate classification symbol in parentheses following the footnote symbol and before the footnote. See Figure 5-6 for an example of a footnote with classification markings.

Illustrations. Illustrations and illustration captions must indicate the level of classification, even if they are unclassified. The classification of the illustration appears centered below the illustration, as shown in Figure 5-7. The classification symbol of the illustration caption appears in parentheses after the illustration number, as shown in Figure 5-7.

Tables. All tables and table captions must indicate the level of classification, even if they are unclassified. The classification of the table appears centered above the table, as shown in Figure 5-8. The classification symbol of the table caption appears in parentheses after the table number, as shown in Figure 5-8.

## References

The overall classification of the report is centered at the top and bottom of each page of the list of references, whether or not the information on the page is classified. Each classified reference is marked with the appropriate classification symbol in parentheses after the title (indicating the classification of the title of the document). The classification of the source is typed in full caps in parentheses after the entry. If an entry is not classified, type "UNCLASSIFIED" in parentheses after the entry. See Figure 5-9 for examples of references with classification markings.

Classified documents are not to be listed in a reference list in unclassified, unlimited distribution publications. (See SECNAVINST 5510.34, available in the Security Office, for further information.)

## Bibliography

The overall classification of the report is centered at the top and bottom of each page of the bibliography, whether or not the information on the page is classified. Each classified entry is marked with the appropriate classification symbol in parentheses after the title (indicating the classification of the title of the document). The classification of the bibliographic entry is typed in full caps in parentheses after each bibliographic entry, as shown in Figure 5-10. If an entry is not classified, type "UNCLASSIFIED" in parentheses after the entry.

If included, classified documents are not be listed in unclassified, unlimited distribution publications. (See SECNAVINST 5510.34.)

## BACK ELEMENTS

## Appendixes

Each appendix carries its own classification markings, which may differ from the classification of the body of the publication. Appendixes are marked as if they are separate reports, each carrying individual classification markings, with the cover carrying the appropriate downgrading and declassification statement, distribution statement, and, if applicable, warning notices. For example, if the body of the report is SECRET and the appendix is CONFIDENTIAL, the body of the report is marked SECRET centered top and bottom of each page, and the appendix is marked CONFIDENTIAL centered top and bottom of each page. In another example, if the body of the report is UNCLASSIFIED and the appendix is CONFIDENTIAL, the front and back covers of the document are marked CONFIDENTIAL, and the following statement will appear on the cover: "Appendix \_\_ is the only classified portion of the publication. Upon removal of Appendix \_\_, this report becomes unclassified." The cover will carry the downgrading and declassification statement, appropriate distribution statement, and, if applicable, warning notices. The appendix will be marked CONFIDENTIAL centered top and bottom of the page, and will be portion marked as required for any classified document. The appendix text is marked the same as for text in the main body of the publication.

### Index

The overall classification of the report is centered at the top and bottom of each page, whether or not the information on the page is classified. If the publication is classified and the entire index is unclassified, mark the heading: (U) INDEX (U) indicating that the list and the title are both unclassified. If any entries in the index are classified, the level of classification must be shown. The Security Office will provide guidance on the appropriate classification markings.

### Distribution

The distribution list, which is always unclassified, is marked UNCLASSIFIED centered at the top and bottom of the page and the heading is marked (U) DISTRIBUTION (U) (see Figure 5-11).

### Back Cover

The overall classification of the publication is centered at the top and bottom of the back cover as shown in Figure 5-12.

<p align="center"><b>CLASSIFICATION</b></p> <p align="center"><b>DAHLGREN DIVISION</b></p> <p align="center"><b>NAVAL SURFACE WARFARE CENTER</b></p> <p align="center">Dahlgren, Virginia 22448-5100</p>	
<p align="center"><b>NSWCDD/TR-94/25</b></p>	
<p align="center"><b>STRAWMAN TACTICAL COMPUTER CODE FOR</b></p> <p align="center"><b>AEGIS ENGAGE ON REMOTE HOMING-OUTSIDE</b></p> <p align="center"><b>REGIONS (U)</b></p>	
<p align="center"><b>BY RICHARD D. HILTON</b></p> <p align="center"><b>SYSTEMS RESEARCH AND TECHNOLOGY DEPARTMENT</b></p>	
<p align="center"><b>FEBRUARY 1994</b></p>	
<p align="center">Classified by Multiple Sources Declassify on OADR</p> <p align="center">Distribution authorized to DoD and DoD contractors only; administrative/operational use (February 1994). Other requests for this document must be referred to Dahlgren Division, Naval Surface Warfare Center (Code BSC), Dahlgren, VA 22448-5100.</p> <p align="center">NOT RELEASABLE TO FOREIGN NATIONALS.</p>	
<p align="center"><b>CLASSIFICATION</b></p>	

FIGURE 5-1. CLASSIFIED FRONT COVER

<p align="center"><b>REPORT DOCUMENTATION PAGE</b></p> <p align="right">Form Approved OAR No. 0704-0118</p> <p><small>Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any aspect of this collection of information, including suggestions for reducing the burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0118), Washington, DC 20503.</small></p>	
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE April 1995
3. REPORT TYPE AND DATES COVERED	
4. TITLE AND SUBTITLE Underwater Blast Effects from Explosive Sovereignty of Offshore Platform Legs and Well Conductors (U)	
5. FUNDING NUMBERS	
6. AUTHOR(s) Joseph G. Connor, Jr.	7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Naval Surface Warfare Center Dahlgren Division (Code BSC) 17320 Dahlgren Road Dahlgren, VA 22448-5100
8. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)	9. SPONSORING/MONITORING AGENCY REPORT NUMBER NSWCDD/TR-95/11
10. SUPPLEMENTARY NOTES	
11. DISTRIBUTION/AVAILABILITY STATEMENT Distribution authorized to U. S. Government agencies and their contractors; administrative/operational use (April 1995). Other requests for this document shall be referred to Dahlgren Division, Naval Surface Warfare Center (Code R15), Dahlgren, VA 22448-5100.	
12. ABSTRACT (Maximum 200 words) (U) Underwater shock waves generated by explosive removal of a hydrocarbon production platform from the Gulf of Mexico were monitored. Twenty-six Composition B charges were detonated inside the bottom penetrating support members at depths beneath the sea bottom ranging from 8 to 26 ft. Charge weights ranged from 25 to 50 lb. Twelve telemetric gauges were placed at three water depths at each of four ranges from each detonation. This data report summarizes the observed characteristics of the underwater shock waves transmitted into the surrounding water. Similar equations are developed from which tentative predictions may be made for similar explosive removal operations under other conditions. No conclusions are drawn about the effects of shock waves on marine life forms that may be in the neighborhood of such explosions.	
13. SUBJECT TERMS Underwater Explosions (U) Composition B (U)	14. NUMBER OF PAGES 138
15. PRICE CODE	16. PRICE CODE
17. SECURITY CLASSIFICATION OF THIS PAGE CONFIDENTIAL	18. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED
19. LIMITATION OF ABSTRACT SAR	20. LIMITATION OF ABSTRACT SAR
NSN 7540-01-280-5500	
Standard Form 298 (Rev. 2/89) Prescribed by ANSI Std. Z39-18	

FIGURE 5-2. CLASSIFIED SF 298

CLASSIFICATION CSS/IR-94/15	
CONTENTS (U)	
INTRODUCTION (U) .....	Page 1
BACKGROUND (U) .....	1
GENERAL (U) .....	1
THEORETICAL (U) .....	2
EXPERIMENTAL (U) .....	3
CONCLUSIONS AND RECOMMENDATIONS (U) .....	12
APPENDIXES—SPECTRAL ANALYSIS DATA (U) .....	A-1
DISTRIBUTION (U) .....	(U)
ILLUSTRATIONS (U)	
Figure	Page
1 FEEDBACK ELECTRONICS CIRCUIT SCHEMATIC (U) .....	6
2 VECTOR ADDITION DIAGRAM OF TWO INPUTS (U) .....	7
3 BLOCK DIAGRAM OF FREQUENCY SYNTHESIZER FUNCTION GENERATOR FEEDBACK SYSTEM (U) .....	10
TABLES (U)	
Table	Page
1 ELECTRONICS REQUIREMENTS (U) .....	6
2 TWO INPUTS PARAMETERS (U) .....	7
3 TEST SCHEDULE (U) .....	10
4 RESULTS OF DAY 5 TESTING (U) .....	11
CLASSIFICATION	

FIGURE 5-4. CLASSIFIED LIST OF CONTENTS, ILLUSTRATIONS, AND TABLES

CLASSIFICATION NSWCDD/IR-94/89	
FOREWORD (U)	
<p>(U) Many U.S. Navy programs have a strong need to be able to make predictions of forward looking infrared (FLIR) camera performance against various threats. An important factor in calculating performance ranges is the atmospheric transmission. Weather information previously combined into databases known as the <i>Random 400</i> and the <i>Random 384</i> (or R400 and R384) was processed into a form that would allow simple estimates of the atmospheric transmission at any given range. This report describes these two databases and the infrared atmospheric transmission modeling that was done using them.</p> <p>(U) This report has been reviewed by Roger Carr, Head, Electro-Optical Systems Branch and Stuart Koch, Acting Head, Search and Track Division.</p> <p>Approved by:</p> <p>THOMAS C. PENDERGRAFT, Head Ship Defense Systems Department</p>	
CLASSIFICATION	

FIGURE 5-3. CLASSIFIED FOREWORD

# CLASSIFICATION

## NSWCDD/MP-95/67

### CLASSIFIED HEADING FORMATS (U)

#### MAIN BODY (U)

#### Text (U)

(U) **Overall Classification of Each Page.** The overall classification appears centered at the top and bottom of each page. However, if a warning notice appears on a page, then the top classification marking reflects the classification and warning notice; e.g., SECRET//NOFORN//WNINTEL. The warning notices are not required to go at the bottom of the page, just the classification. The classification at the top and bottom of each page should be typed in 14-point and bold typeface, as shown in this example.

(U) **Headings.** First-, second-, and third-order headings are marked with the appropriate classification symbol in parentheses after the heading, as shown in Figure 5-6. (However, if these headings are numbered, the classification marking must appear between the number and the heading.) Fourth-order headings are marked with the appropriate classification symbol in parentheses before the heading. Unclassified headings should be used whenever possible.

(U) **Paragraphs, Subparagraphs, Parts, Sections, and Portions.** Each paragraph, subparagraph, part, section, and portion must be marked with the appropriate security classification marking as shown in this example. The appropriate symbol (U), (C), or (S) is set at the normal paragraph indentation, followed by one space and the first word of the paragraph, subparagraph, part, section, or portion. Only warning notices or intelligence control marks in abbreviated form applying to that portion will be included with the classification [e.g., (S/NP)]. See Table 5-1 for further information on warning notices.

(U) **Footnotes.** Footnotes are marked with the appropriate classification symbol\* in parentheses following the footnote symbol and before the footnote. See Figure 5-6 for an example of a footnote with classification markings.

\* (U) Footnotes are marked with the appropriate classification symbol in parentheses following the footnote symbol and before the footnote.

### CLASSIFICATION

FIGURE 5-6. CLASSIFIED MAIN BODY

# CLASSIFICATION

## NSWCDD/TR-94/243

### (U) GLOSSARY (U)

Two-dimensional  
Three-dimensional

Delta Temperature

Above-Deck Sensor Unit

Operational Availability

Airborne Uninhibited

Autonomic Video Tracker

The horizontal angular distance to a position or an object. It is measured clockwise from true north and has units of degrees.

Built-in-Test

Charge-Coupled Device

Command and Display Unit

Command Information Center

Commander, Operational Test and Evaluation Force

Central Processing Unit

Daylight Imaging System

The angle between the horizontal plane and the target. Positive angles are measured upward from horizontal. It has units of degrees.

Electro-Optional

Electro-Optical Systems Evaluation

Experimental Test Fixture

Elapsed Time Indicator

2D  
3D

ΔT

ADSU

Av

Avi

AVT

Azimuth

BIT

CCD

CDU

CIC

COMOPTEVFOR

CPU

DIS

Elevation

E-  
EOSE

ETF

ETI

### CLASSIFICATION

FIGURE 5-5. CLASSIFIED GLOSSARY



# CLASSIFICATION NSWCDD/TR-93/643

## PRELIMINARY DATA PROCESSING AND DATA EDITING (U)

(U) After receipt of the data sets collected aboard the *Laney Chouest* and the GPS tracking data acquired at Newport, Oregon, several data processing steps were undertaken. These included editing acoustics data to remove multiple returns, processing GPS receiver range measurements to position the ship relative to known geodetic control on land, examining acoustics data residuals to eliminate questionable data, evaluating interpolating schemes to determine ship location at acoustic signal receive times, connecting GPS antenna locations to the transducer through the use of GPS-derived ship attitude data, and editing data sets to produce complete data coverage over selected time intervals. Several of these procedures were executed at the beginning of the data processing, others were added as the data analysis proceeded, refining methods and including more complete modeling. The following paragraphs summarize these procedures.

## INITIAL EDITING TO REMOVE MULTIPLE RETURNS (U)

(U) Each transponder within the USGS and NOAA arrays operates with a unique response frequency. The frequencies of the transponders whose data were processed in this study are given in Table 1, along with their approximate positions. During a first evaluation of the acoustics data collected aboard ship, it was readily evident that the data files consistently contained multiple (up to four) returns from each transponder. This was clearly a result of multiple reflections of the transmitted acoustic signal off the seafloor and ocean surface, which then triggered additional chirps from the transponder instrumentation.

(U) Using approximate locations for the transponder and ship positions, an initial editing of all acoustic data was completed to identify and eliminate all but principal returns from each transponder associated with a 20-sec transducer pulse rate. These edited files, configured on an hourly basis, represented the source data for all subsequent processing steps.

TABLE 1. (U) TRANSPONDER INFORMATION  
UNCLASSIFIED

Instrument Number	Latitude* (deg)	Longitude* (deg)	Depth (m)	Frequency (Hz)
NOAA 04	44.706	229.679	-1987	13000
USGS 05	44.667	229.635	-2205	11500
USGS 06	44.671	229.64*	-2205	12000
USGS 07	44.673	229.639	-2205	12500

\* (U) Approximate position in WGS 84

# CLASSIFICATION 8

FIGURE 5-8. CLASSIFIED TABLE

# CLASSIFICATION NSWCDD/TR-93/643

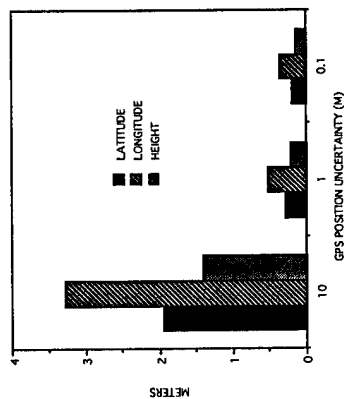


FIGURE 3. (U) TRANSPONDER ARRAY UNCERTAINTY VS. GPS  
POSITIONING UNCERTAINTY FOR TRACK PATTERN 1  
UNCLASSIFIED

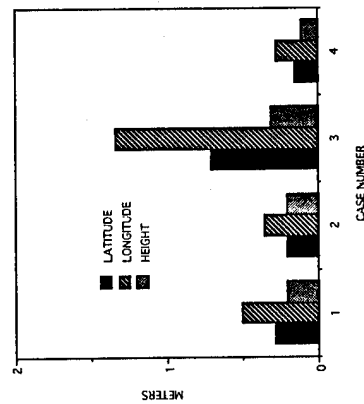


FIGURE 4. (U) TRANSPONDER UNCERTAINTY ASSOCIATED WITH L-M GPS  
UNCLASSIFIED  
4

FIGURE 5-7. CLASSIFIED ILLUSTRATIONS

CLASSIFICATION  
NSWCDD/TR-93/243

#### REFERENCES (U)

1. *Electro-Optical Systems Evaluation Program Master Plan*, NSWCDD/MP-93/125, Mar 1993, Dahlgren, VA. (UNCLASSIFIED)
2. *Electro-Optical System Evaluation Questionnaire*, TRW, Proposal, 19 Feb 1993. (UNCLASSIFIED)
3. *System Specification for Optical Sight EX 46 Mod 0*, NSWCDD, System Specification, WS 32735, 1 Jun 1989. (UNCLASSIFIED)
4. George, E., *FLIR Performance Assessment Against Selected U.S. Navy Targets* (Working Papers), 17 Jun 1992, Dahlgren, VA. (UNCLASSIFIED)
5. "Implications to Naval Warfare," *Optical Spectrum Domination Symposium*, Director, Naval Surface Warfare Division, 29-30 Mar 1993. (UNCLASSIFIED)
6. OPNAVINST 3000.12, *Operational Availability*. (UNCLASSIFIED)
7. *Questionnaire-Land-Based Evaluation of Electro-Optical Tracking Sensor Systems*, Kollmorgen Corporation, Proposal, 19 Feb 1993. (UNCLASSIFIED)
8. *Land-Based Evaluation of Electro-Optical Tracking Sensor Systems*, Loral Defense Systems-Akron, Proposal, 19 Feb 1993. (UNCLASSIFIED)
9. MIL-HDBK-472, *Maintainability Prediction*. (UNCLASSIFIED)
10. MIL-STD-781, *Reliability Testing for Engineering Development, Qualification, and Production*. (UNCLASSIFIED)

CLASSIFICATION<sup>25</sup>

FIGURE 5-9. CLASSIFIED REFERENCES

CLASSIFICATION  
NSWCDD/TR-93/243

#### BIBLIOGRAPHY (U)

- Electro-Optical Systems Evaluation Program Master Plan*, NSWCDD/MP-93/125, Mar 1993, Dahlgren, VA. (UNCLASSIFIED)
- George, E., *FLIR Performance Assessment Against Selected U.S. Navy Targets* (Working Papers), 17 Jun 1992, Dahlgren, VA. (UNCLASSIFIED)
- "Implications to Naval Warfare," *Optical Spectrum Domination Symposium*, Director, Naval Surface Warfare Division, 29-30 Mar 1993. (UNCLASSIFIED)
- OPNAVINST 3000.12, *Operational Availability*. (UNCLASSIFIED)
- Questionnaire-Land-Based Evaluation of Electro-Optical Tracking Sensor Systems*, Kollmorgen Corporation, Proposal, 19 Feb 1993. (UNCLASSIFIED)
- System Specification for Optical Sight EX 46 Mod 0*, NSWCDD, System Specification, WS 32735, 1 Jun 1989. (UNCLASSIFIED)

CLASSIFICATION<sup>25</sup>

FIGURE 5-10. CLASSIFIED BIBLIOGRAPHY

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(U) DISTRIBUTION (U)		
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ATTN: CODE E29L (TECHNICAL LIBRARY) COMMANDING OFFICER CSSDD NSWC 6703 W HIGHWAY 98 PANAMA CITY FL 32407-7001	1	B B30 B32 LEITE B35 B35 KNUDSEN B35 THOMAS B35 BROWN E331 E382 GRAY F31 F31 INGOLD N05 N24 N55 ENG
DEFENSE TECHNICAL INFORMATION CENTER CAMERON STATION ALEXANDRIA VA 22304-6145	2	

FIGURE 5-11. DISTRIBUTION LIST IN A CLASSIFIED REPORT

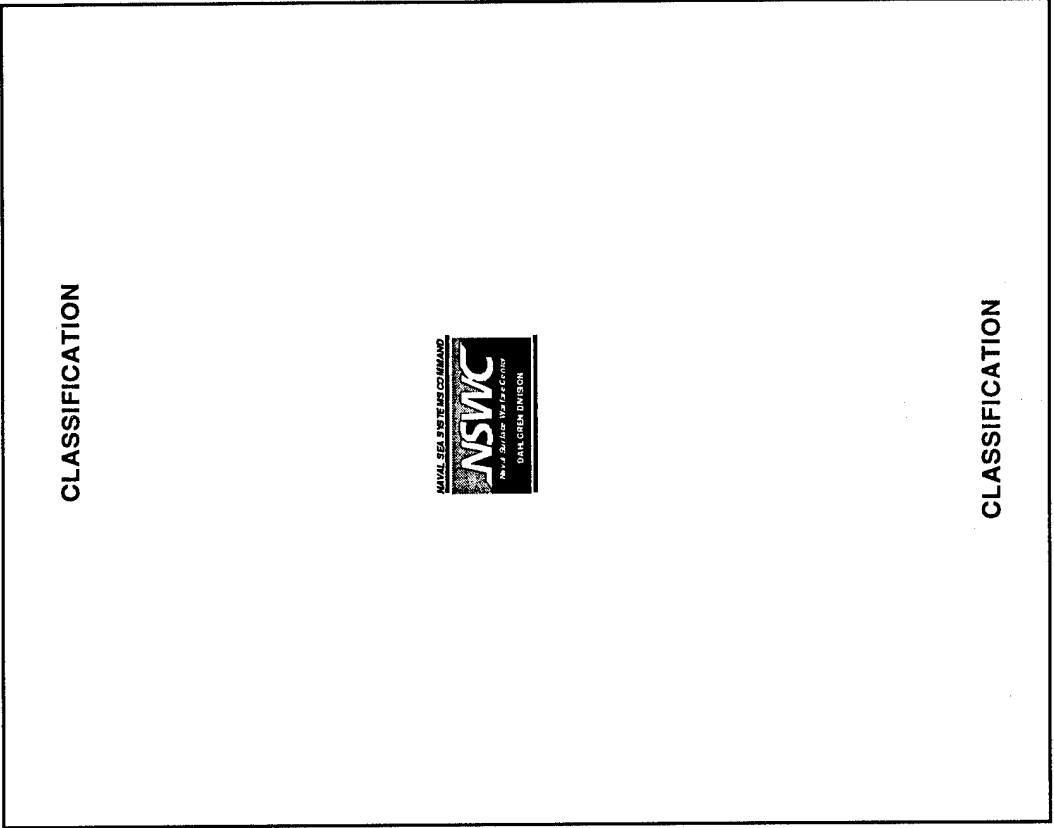


FIGURE 5-12. CLASSIFIED BACK COVER

TABLE 5-1. WARNING NOTICES

Classification	Warning Notice	Appropriate Paragraph Classification Markings
CONFIDENTIAL or SECRET	Restricted Data	(C/RD) or (S/RD)
CONFIDENTIAL or SECRET	Critical Nuclear Weapon Design Information (CNWDI)	(C/RD) (N) or (S/RD) (N)*
CONFIDENTIAL or SECRET	Formerly Restricted Data	(C/FRD) or (S/FRD)
CONFIDENTIAL or SECRET	Not Releasable to Foreign Nationals (NOFORN)**	(C/NF) or (S/NF)
UNCLASSIFIED, CONFIDENTIAL, or SECRET documents determined to contain export-controlled technical data.	WARNING—This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C. Sec. 2751 et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App 2401, et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of OPNAVINST 5510.161.	N/A

\* CNWDI is categorized as Restricted Data; therefore, the classification marking for CNWDI; e.g., (N), must be used with the classification marking for Restricted Data; e.g., (C/RD) (N) or (S/RD) (N).

\*\* This is an example of intelligence control markings; others are explained in OPNAVINST 5510.1H, paragraph 12-20 and placement/format of these are shown in Exhibit 9H. Note: Intelligence control markings are applied derivatively from intelligence source documents or as specified in intelligence programs security classification guides.

## **CHAPTER 6**

### **NSWCDD PUBLICATION REVIEW/APPROVAL PROCESS**

PRA FORM, NSWCDD 5219/1 (REV 04-94)

The PRA Form ensures that publications are adequately reviewed and approved prior to printing. A PRA Form is completed for all NSWCDD publications. Figure 6-1 provides an example of a PRA.

The form is prepared by the Technical Publications Branch (at Dahlgren) or by the author (at CSS). It is then forwarded with a draft publication prepared by the Technical Publications Branch or the original publication, including illustrations, through the review process.

#### **Form Retention**

The Technical Publications Branch (at Dahlgren) and the Security Office (Code 0543) (at CSS) retain the PRA Forms for record purposes.

PUBLICATION REVIEW/APPROVAL (PRA)					
PUBLICATION NUMBER		TITLE			
JOB ORDER NUMBER		AUTHOR(S)		CODE/EXTENSION/LOCATION	
DATE TO APPEAR ON PUBLICATION		WRITER/EDITOR		<input type="checkbox"/> FORMAT REVIEW (mandatory) <input type="checkbox"/> EDIT PUBLICATION	
CLASSIFICATION <input type="checkbox"/> UNCLASSIFIED <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> SECRET	DISTRIBUTION <input type="checkbox"/> PUBLIC RELEASE <input type="checkbox"/> LIMITED DISTRIBUTION <small>(see page 3.)</small> <input type="checkbox"/> FOR OFFICIAL USE ONLY <small>(see page 4.)</small>	DISTRIBUTION RESTRICTIONS <small>[e.g., Exempt from distribution to DTIC.            (Type the appropriate restrictions below.)]</small>		MILITARILY CRITICAL TECHNOLOGY <input type="checkbox"/> YES <input type="checkbox"/> NO <small>IF YES, APPLICABLE AREA</small>	
ROUTING	DATE		APPROVED		COMMENTS
	IN	OUT	DATE	SIGNATURE	
Author					
Branch Head					
Division Head/ Tech. Office Head					
Department Head					
Patent Counsel					
Security					
Public Affairs (If Public Release)					
Publications					
Printing					

FIGURE 6-1. PUBLICATION REVIEW/APPROVAL FORM

RESPONSIBILITIES OF REVIEWERS	
Reviewer	Responsibility
Author	<input type="checkbox"/> Ensure Technical Accuracy <input type="checkbox"/> Note Security Classifications and Markings <input type="checkbox"/> Provide Distribution List <input type="checkbox"/> Review Military Critical Technology List Criteria <input type="checkbox"/> Provide Distribution Statement (See page 3) <input type="checkbox"/> Provide Information for PRA Form and SF 298 (Except for Those Documents Specifically Excluded by DoD Directive 3200.12)
Technical Reviewer	<input type="checkbox"/> Review for Technical Accuracy
Branch Head	<input type="checkbox"/> Review for Technical Accuracy <input type="checkbox"/> Review Security Classifications and Markings <input type="checkbox"/> Approve Document for Publication
Division Head	<input type="checkbox"/> Approve Document for Publication
Department Head	<input type="checkbox"/> Approve Document for Publication
Technical Writer/Editor	<input type="checkbox"/> Assign Publication Number <input type="checkbox"/> Edit Document <input type="checkbox"/> Arrange for Generation/Preparation of Graphics <input type="checkbox"/> Prepare Final Publication Review/Approval Form, Cover, and SF 298 <input type="checkbox"/> Prepare Reports Distribution Record (COASTSYSTA) <input type="checkbox"/> Prepare Camera-Ready Document and Printing Request, and Forward to Print Shop <input type="checkbox"/> Review the Printed Copy Before Distribution <input type="checkbox"/> File PRA Form After Document is Distributed (DL and WO)
Patent Counsel	<input type="checkbox"/> Review for Invention Disclosure
Public Affairs	<input type="checkbox"/> Review Documents for Public Release
Information Security	<input type="checkbox"/> Review Security Classifications and Markings <input type="checkbox"/> Review Distribution Statement <input type="checkbox"/> Review for Military Critical Technology <input type="checkbox"/> Review Addresses on Distribution List
Print Shop	<input type="checkbox"/> Print Document <input type="checkbox"/> Contact Printing Requester for Review of Printed Copy <input type="checkbox"/> Forward Documents to Mail Room for Distribution
Mail Room	<input type="checkbox"/> Distribute Documents in Accordance with Distribution List <input type="checkbox"/> Retain Reports Distribution Record (COASTSYSTA) <input type="checkbox"/> File PRA Form after Document is Distributed (COASTSYSTA)
Library	<input type="checkbox"/> Retain Copies of Document <input type="checkbox"/> Enter SF 298 Information into DTIC Databases (DL and WO) <input type="checkbox"/> Retain Camera-Ready Copy of Distributed Documents (COASTSYSTA)

## DOWNGRADING STATEMENTS

☐ Classified by \_\_\_\_\_  
(authority)

Declassify on OADR

☐ Classified by Multiple Sources  
 (List multiple source documents below)

Declassify on OADR

MULTIPLE SOURCE DOCUMENTS:

## DESTRUCTION NOTICE

For unclassified, limited distribution documents, destroy by any method that will prevent disclosure of contents or reconstruction of the document.

FIGURE 6-1. PUBLICATION REVIEW/APPROVAL FORM (Continued)

## WARNING NOTICES

- ☐ Classified by \_\_\_\_\_  
(authority)

RESTRICTED DATA (This material contains RESTRICTED DATA as defined in the Atomic Energy Act of 1954. Unauthorized disclosure subject to administrative and criminal sanctions.)

- ☐ Classified by \_\_\_\_\_  
(authority)

Formerly RESTRICTED DATA (Unauthorized disclosure subject to administrative and criminal sanctions. Handle as Restricted Data in foreign dissemination. Section 144B, Atomic Energy Act of 1954.

- ☐ CRITICAL NUCLEAR WEAPONS DESIGN INFORMATION

- ☐ WARNING—This document contains technical data whose export is restricted by the Arms Export Control Act (Title 22, U.S.C. Sec. 2751 et seq.) or the Export Administration Act of 1979, as amended, Title 50, U.S.C., App 2401, et seq. Violations of these export laws are subject to severe criminal penalties. Disseminate in accordance with provisions of OPNAVINST 5510.161.

- ☐ NOT RELEASABLE TO FOREIGN NATIONALS

- ☐ WARNING NOTICE—INTELLIGENCE SOURCES OR METHODS INVOLVED

- ☐ Other Warning Notices (explain below):

## DISTRIBUTION STATEMENTS

(Mark the distribution statement that applies to the publication.  
See Page 4 of this form for definitions of the justifications.)

- ☐ A. Approved for public release; distribution is unlimited.
- ☐ B. Distribution authorized to U.S. Government agencies only; (insert one of the following and the date of the report).
- ☐ foreign government information
  - ☐ proprietary information
  - ☐ critical technology
  - ☐ test and evaluation
  - ☐ contractor performance evaluation
  - ☐ premature dissemination
  - ☐ administrative/operational use
  - ☐ software documentation
  - ☐ specific authority ( \_\_\_\_\_ )  
(identify valid documented authority)
- Other requests for this document shall be referred to \_\_\_\_\_  
(organization) (code)
- ☐ C. Distribution authorized to U.S. Government agencies and their contractors; (insert one of the following and the date of the report).
- ☐ foreign government information
  - ☐ critical technology
  - ☐ software documentation
  - ☐ administrative/operational use
  - ☐ specific authority ( \_\_\_\_\_ )  
(identify valid documented authority)
- Other requests for this document shall be referred to \_\_\_\_\_  
(organization) (code)

- ☒ D. Distribution authorized to DoD and DoD contractor's only; (insert one of the following and the date of the report).
- ☐ foreign government information
  - ☒ administrative/operational use
  - ☐ software documentation
  - ☐ critical technology
  - ☐ specific authority ( \_\_\_\_\_ )  
(identify valid documented authority)
- Other requests for this document shall be referred to \_\_\_\_\_  
(organization) (code)

- ☐ E. Distribution authorized to DoD components only; (insert one of the following and the date of the report).
- ☐ direct military support
  - ☐ foreign government information
  - ☐ proprietary information
  - ☐ premature dissemination
  - ☐ test and evaluation
  - ☐ software documentation
  - ☐ contractor performance evaluation
  - ☐ critical technology
  - ☐ administrative/operational use
  - ☐ specific authority ( \_\_\_\_\_ )  
(identify valid documented authority)
- Other requests for this document shall be referred to \_\_\_\_\_  
(organization) (code)
- ☐ F. Further dissemination only as directed by \_\_\_\_\_  
(organization) (code)  
or higher DoD authority (insert date of the report).
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(organization) (code)

## Examples of format for the above statements:

Distribution authorized to U.S. Government agencies only; test and evaluation (June 1994). Other requests for this document shall be referred to NSWCDD (Code G20), Dahlgren, VA 22448-5100.

Further dissemination only as directed by NAVSEASYS COM (Code SEA-66) or higher DoD authority (June 1994).

FIGURE 6-1. PUBLICATION REVIEW/APPROVAL FORM (Continued)



**DISTRIBUTION STATEMENT JUSTIFICATIONS\***

**Administrative/Operational Use**—To protect technical or operational data or information from automatic dissemination under the International Exchange Program or by other means. This protection covers publications required solely for official use or strictly for administrative or operational purposes. This statement may be applied to manuals, pamphlets, technical orders, technical reports, and other publications containing valuable technical or operational data.

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\*Extracted from OPNAVINST 5510.1H.

**FOR OFFICIAL USE ONLY**

(Document may only be considered FOUO if it fits within the guidelines of one of the following exemptions.)

**Exemption 1**—Refers to information which is currently and properly classified and is authorized to remain classified in the interest of national security.

**Exemption 2**—Refers to information containing or constituting rules, regulations, orders, manuals, directives, and instructions relating to the internal personnel rules of practice of the Department of the Navy (DoN) if performance of a significant function of the DoN and they do not impose requirements directly on the general public.

**Exemption 3**—Refers to information which is specifically exempted from disclosure by statute that permits no discretion on the issue, or in accordance with criteria established by the statute for withholding or referring to the particular types of information to be withheld.

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**Exemption 9**—Refers to geological and geophysical information and data (including maps) concerning wells.

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FIGURE 6-1. PUBLICATION REVIEW/APPROVAL FORM (Continued)

## CHAPTER 7

### COPYRIGHTS AND TRADEMARKS

#### COPYRIGHTS

The 1978 copyright law protects copyrightable works that include literary works; musical and dramatic works; pictorial, graphic, and sculptured works; audiovisual works; and sound recordings. Published works must bear a copyright notice. The copyright period is "the life of the author plus 50 years."

##### Do Not Copyright

Material written by government employees as part of their official duties is not copyrighted. One person may not copyright work originated by another.

##### Fair Use

Copyrighted material may be quoted in NSWCDD publications if copyright owners are properly credited. Standard footnote procedure is used to credit authors. NSWCDD publications that contain paraphrased information must also credit the source of information.

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If the use of copyrighted material is in the best interest of the Government, the copyright owner should be contacted. Permission to reprint the material may be granted without charge; if a charge is required, the copyright owner will specify the amount and method of reimbursement. To make a royalty payment, a procurement request (stub requisition) is initiated, specifying the copyright owner as the suggested supplier. For further information about royalties, contact the NSWCDD Patent Office.

#### TRADEMARKS

A trademark is a word, phrase, or symbol used to identify a product. The trademark is the property of the firm using the mark in commerce. Methods of indicating a protected mark include

- TM—unregistered trademark
- SM—unregistered service mark (equivalent to a trademark except that it designates services rather than goods)
- ®—trademark or service mark registered with the U.S. Patent Office

In NSWCDD publications, it is not necessary to use these symbols if the trademark is capitalized.

Government specifications require that trademarks and trade names not be used unless there is a specific need. A generic term should be used in the place of the trademark or trade name.

#### Trademarks in the Text

If used, initial cap the trademark in the text. If it is an adjective, not a noun; the noun that follows the trademark (the generic term) is not capitalized.

#### Patent

For further information about trademarks, contact the NSWCDD Patent Office.

## CHAPTER 8

### CHANGES TO TRs, TNs, MPs, and APs

#### GENERAL

A change to a publication is necessary when the classification changes or when information becomes outdated, incorrect, or must be supplemented. The change procedure is an abbreviated version of that used to publish the original report. Two forms must accompany the changed manuscript: (1) the Change Transmittal Form and (2) the PRA Form.

#### PUBLICATION

a. Retype or correct the pages involved. If the changed pages are to be inserted in a classified publication, type the classification at the top and bottom of each page. Include all the back pages; even if they are not being changed, they must be reprinted.

b. Type "Change" with the change number (e.g., Change 1, Change 2, etc.) on the bottom outside margin, in line with the page number. For odd-numbered pages, this is the right side, and for even-numbered pages, the left side. Do not type anything on unchanged back pages.

#### CHANGE TRANSMITTAL FORM

The Change Transmittal Form [NAVSWC 5600/3 (REV 08-90)] has non-reproducible blue lines to assist in the proper placement of information. A completed Change Transmittal Form is shown in Figure 8-1.\* Directions for preparing this form include the following.

- a. Enter the number and title of the original publication.
- b. Enter the number of the change under the desk code in the upper right corner and in the paragraph at the bottom of the page.
- c. Enter the date of the change below the change number.
- d. Enter the number of pages in the change. Count all pages in the package, whether they are changed pages or unchanged back pages, and the Change Transmittal Form.
- e. If the change package is to be inserted into a classified publication, enter the classification of the original publication at the top and bottom of the form in a larger type than the text. Enter also the following explanatory paragraph.

\* A Change Transmittal Form for an unclassified publication is prepared as shown in Figure 8-1 except that no security classification markings appear.

"Pages in this change, although unclassified, are marked with the overall classification of the publication into which they are to be inserted."

- f. Enter the applicable instructions for incorporation of the change into the publication. Typical statements are shown in Figure 8-1.
- g. If the change package is classified, place the appropriate downgrading/declassification statement on the Change Transmittal Form, as shown in Figure 8-1.
- h. If the Change Transmittal Form has been marked with a classification of any kind, individually mark the paragraphs, as shown in Figure 8-1. (The first and last paragraphs are preprinted on the form, and space has been allowed for the addition of classification markings to the left of them.)
- i. Have the "Approved by" line signed by the approving official of the original publication or an official with equivalent signature authority.

#### PRA FORM

- a. Fill out a new PRA Form (discussed in Chapter 6). Include both the publication identification number and the change number in Block 1 of the PRA Form.
- b. At the top after PUBLICATION REVIEW/APPROVAL (PRA), type "TO ALL HOLDERS." (See Figure 8-2.)
- c. Obtain signatures from the author (or the author's successor) and the approving official.
- d. Obtain signatures from Patent Counsel, Security Office, and Technical Publications, in all cases.
- e. If the change involves altering the distribution statement from limited to public release, the requester should, during initial preparation of the PRA Form, add a statement in the Comments column "PUBLIC RELEASE REQUESTED" and also obtain a signature from Public Affairs.

CONFIDENTIAL



DEPARTMENT OF THE NAVY  
NAVAL SURFACE WARFARE CENTER  
DAHLGREN, VIRGINIA 22448-5000

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(301) 394- 1800

DAHLGREN, VA 22448-5000  
(703) 663-

IN RELY REFER TO:

E28:DBJ:bj

Change 1

1 June 1994

To all holders of NSWCDD/TR-94/890

Title: Hypervelocity Tunnel 9 Mach 8 Calibration (U)

19 page(s)

(U) This publication is changed as follows:

Remove the following pages and replace with new pages supplied:

13/14

15/16

29 through 36

Insert the following new pages supplied:

63 through 70

Make the following pen-and-ink changes:

Page 4, paragraph 3, change "Mach 6" to "Mach 8"

Page 43, Figure 3, change "R1" in schematic to "R4"

(U) Dispose of the removed pages in accordance with applicable security regulations.

(U) The downgrading/declassification data assigned to the basic publication apply.

Insert this change sheet directly behind the front cover in your copy.

Write on the cover "Change 1 inserted"

Approved by:

CONFIDENTIAL

D. B. JOHNSTON

Note: Classification markings for training purposes, otherwise UNCLASSIFIED.

FIGURE 8-1. CHANGE TRANSMITTAL FORM

PUBLICATION REVIEW/APPROVAL (PRA) TO ALL HOLDERS					
PUBLICATION NUMBER		TITLE			
JOB ORDER NUMBER		AUTHOR(S)		CODE/EXTENSION/LOCATION	
DATE TO APPEAR ON PUBLICATION		WRITER/EDITOR		<input type="checkbox"/> FORMAT REVIEW (mandatory) <input type="checkbox"/> EDIT PUBLICATION	
CLASSIFICATION <input type="checkbox"/> UNCLASSIFIED <input type="checkbox"/> CONFIDENTIAL <input type="checkbox"/> SECRET	DISTRIBUTION <input type="checkbox"/> PUBLIC RELEASE <input type="checkbox"/> LIMITED DISTRIBUTION (see page 3.) <input type="checkbox"/> FOR OFFICIAL USE ONLY (see page 4.)	DISTRIBUTION RESTRICTIONS [e.g., Exempt from distribution to DTIC. (Type the appropriate restrictions below.)]		MILITARILY CRITICAL TECHNOLOGY <input type="checkbox"/> YES <input type="checkbox"/> NO IF YES, APPLICABLE AREA	
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	N	OUT	DATE	SIGNATURE	
Author					
Branch Head					
Division Head/ Tech. Office Head					
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FIGURE 8-2. PRA FORM FOR CHANGE PAGES

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